



**REPUBLIC OF KENYA**

# **NATIONAL OCCUPATIONAL STANDARDS**

**FOR**

**HORTICULTURE PRODUCER**

**LEVEL 6**



TVET CDACC  
P.O. BOX 15745-00100  
NAIROBI

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## **FOREWORD**

The provision of quality education and training is fundamental to the Government's overall strategy for social economic development. Quality education and training will contribute to achievement of Kenya's development blueprint, Vision 2030 and sustainable development goals.

Reforms in the education sector are necessary for the achievement of Kenya Vision 2030 and meeting the provisions of the Constitution of Kenya 2010. The education sector had to be aligned to the Constitution of Kenya 2010 and this resulted to the formulation of the Policy Framework for Reforming Education and Training (Sessional Paper No. 4 of 2016). A key feature of this policy is the radical change in the design and delivery of the TVET training. This policy document requires that training in TVET shall be competency based, curriculum development shall be industry led, certification shall be based on demonstration of competence and mode of delivery shall allow for multiple entry and exit in TVET programmes.

These reforms demand that Industry takes a leading role in curriculum development to ensure the curriculum addresses its competence needs. It is against this background that these Occupational Standards were developed for the purpose of developing a competency based curriculum for Horticulture producer. These Occupational Standards will also be the bases for assessment of an individual for competence certification.

It is my conviction that these Occupational Standards will play a great role towards development of competent human resource for the Agriculture sector's growth and sustainable development.

**PRINCIPAL SECRETARY, VOCATIONAL AND TECHNICAL TRAINING  
MINISTRY OF EDUCATION**

## **PREFACE**

Kenya Vision 2030 aims to transform the country into a newly industrializing, “middle-income country providing a high quality life to all its citizens by the year 2030”. Kenya intends to create a globally competitive and adaptive human resource base to meet the requirements of a rapidly industrializing economy through life-long education and training. TVET has a responsibility of facilitating the process of inculcating knowledge, skills and attitudes necessary for catapulting the nation to a globally competitive country, hence the paradigm shift to embrace Competency Based Education and Training (CBET).

The Technical and Vocational Education and Training Act No. 29 of 2013 and Sessional Paper No. 4 of 2016 on Reforming Education and Training in Kenya, emphasized the need to reform curriculum development, assessment and certification in TVET. This called for shift to CBET in order to address the mismatch between skills acquired through training and skills needed by industry as well as increase the global competitiveness of Kenyan labour force.

The TVET Curriculum Development, Assessment and Certification Council (TVET CDACC), in conjunction with Aquaculture Sector Skills Advisory Committee (SSAC), German International Cooperation and Ministry of Agriculture, Livestock and Fisheries have developed these Occupational Standards for a Horticulture processor. These standards will be the bases for development of competency based curriculum for Horticulture producer level 6.

The occupational standards are designed and organized with clear performance criteria for each element of a unit of competency. These standards also outline the required knowledge and skills as well as evidence guide.

I am grateful to the Council members, Council Secretariat, Horticulture SSAC, expert workers and all those who participated in the development of these occupational standards.

**Prof. CHARLES M. M. ONDIEKI, PhD, FIET (K), Con. EngTech.  
CHAIRMAN, TVET CDACC**

## **ACKNOWLEDGMENT**

These Occupational Standards were developed through combined effort of various stakeholders from private and public organizations. I am thankful to the management of these organizations for allowing their staff to participate in this course. I wish to acknowledge the invaluable contribution of industry players who provided inputs towards the development of these Standards.

I thank TVET Curriculum Development, Assessment and Certification Council (TVETCDACC) for providing guidance on the development of these Standards. My gratitude goes to Aquaculture Sector Skills Advisory Committee (SSAC) members for their contribution to the development of these Standards. I thank all the individuals and organizations who participated in the validation of these Standards.

My gratitude also goes to NEPAD Planning and Coordinating Agency (NPCA) of the Africa Union Commission and German Ministry of Economic Cooperation and Development (BMZ) through its implementing agency German International Cooperation (GIZ) GmbH which enabled the development of these Standards through the CAADP ATVET project.

I also appreciate the office of the National Coordinator of GIZ CAADP ATVET Project which was instrumental in the cooperation between the project team, Ministry of Agriculture, Livestock and Fisheries (MoALF) and Ministry of Education.

I acknowledge all other institutions which in one way or another contributed to the development of these standards.

## **CHAIRMAN**

### **HORTICULTURE SECTOR SKILLS ADVISORY COMMITTEE**

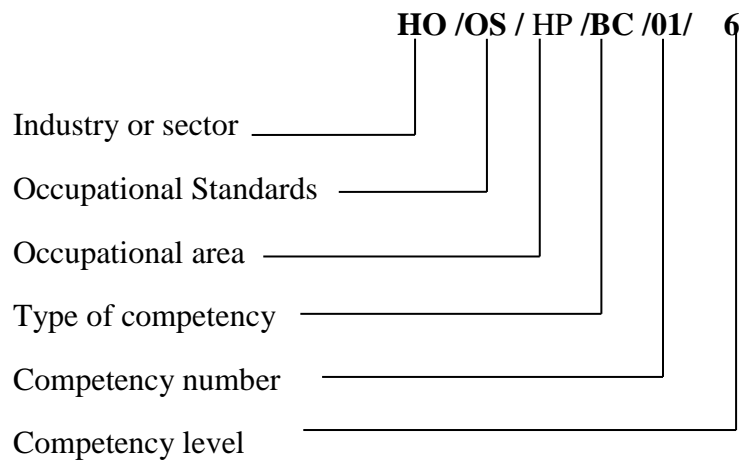
## ACRONYMS

ATVET	: Agricultural Technical and Vocational Education and Training
CAADP	: Comprehensive Africa Agricultural Development Programme
CBET	: Competency Based Education and Training
CDACC	: Curriculum Development Assessment and Certification Council
CUR	: Curriculum
DACUM	: Develop a Curriculum
EMCA	: Environmental Management and Conservation Act
GAP	: Good Agricultural Practices
GDP	: Gross Domestic Product
GMOs	: Genetically Modified Organisms
HCDA	: Horticultural Crops Development Authority
HCP	: Horticultural Crop Production
HNO	: Horticultural Nursery Operator
IDM	: Integrated Disease Management
IPM	: Integrated Pest Management
IWM	: Integrated Weed Management
KCSE	: Kenya Certificate of Secondary Education
KNQA	: Kenya National Qualifications Authority
MoALF	: Ministry of Agriculture Livestock and Fisheries
MoEST	: Ministry of Education Science and Technology
NGO	: Non-Governmental Organization

NOS	: National Occupation Standard
OS	: Occupational Standard
OSHA	: Occupation Safety and Health Act
PPE	: Personal Protective Equipment
RPL	: Recognition of Prior Learning
SSAC	: Sector Skills Advisory Committee
TC	: Tissue Culture
TVETA	: Technical and Vocational Education and Training Authority



## KEY TO UNIT CODE



## **OVERVIEW**

Horticulture Producer level 6 consists of competencies that an individual must achieve to grow and manage horticultural produce. It entails producing tropical fruits, temperate fruits, vine fruits, mushrooms, herbs and spices, nuts, ornamental plants, cut flowers, vegetable crops and managing a horticultural farm.

The qualification consists of the following basic and core competencies:

### **BASIC COMPETENCIES**

1. Demonstrate communication skills
2. Demonstrate numeracy skills
3. Demonstrate digital literacy
4. Demonstrate entrepreneurial skills
5. Demonstrate employability skills
6. Demonstrate environmental literacy
7. Demonstrate occupational safety and health practices

### **CORE COMPETENCIES**

1. Produce tropical fruits
2. Produce sub-tropical fruits
3. Produce temperate fruits
4. Produce vine fruits
5. Produce mushrooms
6. Produce herbs and spices
7. Produce horticultural nuts
8. Produce ornamental plants
9. Produce cut flowers
10. Produce vegetable crops
11. Manage horticulture production farm

## **BASIC UNITS OF COMPETENCY**

## DEMONSTRATE COMMUNICATION SKILLS

**UNIT CODE:** HO/OS/HP/BC/01/6

### UNIT DESCRIPTION

This unit covers the competencies required in meeting communication needs of clients and colleagues; developing, establishing, maintaining communication pathways and strategies. It also covers competencies for conducting interview, facilitating group discussion and representing an organization in various forums.

### ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
These describe the key outcomes which make up workplace function	These are assessable statements which specify the required level of performance for each of the elements. <i><b>Bold and italicized terms are elaborated in the Range</b></i>
1. Meet communication needs of clients and colleagues	1.1 Specific communication needs of clients and colleagues are identified and met 1.2 Different approaches are used to meet communication needs of clients and colleagues 1.3 Conflict is addressed promptly and in a timely way and in a manner which does not compromise the standing of the organization
2. Develop communication strategies	2.1 Strategies for effective internal and external dissemination of information are developed to meet the organization's requirements 2.2 Special communication needs are considered in developing strategies to avoid discrimination in the workplace 2.3 Communication <i><b>strategies</b></i> are analyzed, evaluated and revised where necessary to make sure they are effective
3. Establish and maintain communication pathways	3.1 Pathways of communication are established to meet requirements of organization and workforce 3.2 Pathways are maintained and reviewed to ensure personnel are informed of relevant information
4. Promote use of communication strategies	4.1 Information is provided to all areas of the organization to facilitate implementation of the strategy 4.2 Effective communication techniques are articulated and modelled to the workforce 4.3 Personnel are given guidance about adapting communication strategies to suit a range of contexts
5. Conduct interview	5.1 A range of appropriate communication strategies are employed in <i><b>interview situations</b></i> 5.2 Records of interviews are made and maintained in accordance with organizational procedures

	5.3 Effective questioning, listening and nonverbal communication techniques are used to ensure that required message is communicated
6. Facilitate group discussion	<p>6.1 Mechanisms which enhance <i>effective group interaction</i> is defined and implemented</p> <p>6.2 Strategies which encourage all group members to participate are used routinely</p> <p>6.3 Objectives and agenda for meetings and discussions are routinely set and followed</p> <p>6.4 Relevant information is provided to group to facilitate outcomes</p> <p>6.5 Evaluation of group communication strategies is undertaken to promote participation of all parties</p> <p>6.6 Specific communication needs of individuals are identified and addressed</p>
7. Represent the organization	<p>7.1 When participating in internal or external forums, presentation is relevant, appropriately researched and presented in a manner to promote the organization</p> <p>7.2 Presentation is clear and sequential and delivered within a predetermined time</p> <p>7.3 Appropriate media is utilized to enhance presentation</p> <p>7.4 Differences in views are respected</p> <p>7.5 Written communication is consistent with organizational standards</p> <p>7.6 Inquiries are responded in a manner consistent with organizational standard</p>

## RANGE

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

Variable	Range
Communication <i>strategies</i> include but not limited to:	<ul style="list-style-type: none"> <li>• Language switch</li> <li>• Comprehension check</li> <li>• Repetition</li> <li>• Asking confirmation</li> <li>• Paraphrase</li> <li>• Clarification request</li> <li>• Translation</li> <li>• Restructuring</li> <li>• Approximation</li> <li>• Generalization</li> </ul>
<i>Effective group interaction</i> include but not limited to:	<ul style="list-style-type: none"> <li>• Identifying and evaluating what is occurring within an interaction in a non judgmental way</li> </ul>

	<ul style="list-style-type: none"> <li>• Using active listening</li> <li>• Making decision about appropriate words, behavior</li> <li>• Putting together response which is culturally appropriate</li> <li>• Expressing an individual perspective</li> <li>• Expressing own philosophy, ideology and background and exploring impact with relevance to communication</li> </ul>
<i>Situations</i> include but not limited to:	<ul style="list-style-type: none"> <li>• Establishing rapport</li> <li>• Eliciting facts and information</li> <li>• Facilitating resolution of issues</li> <li>• Developing action plans</li> <li>• Diffusing potentially difficult situations</li> </ul>

## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

### Required Skills

The individual needs to demonstrate the following skills:

- Effective communication
- Active listening
- Giving/receiving feedback
- Interpretation of information
- Role boundaries setting
- Negotiation
- Establishing empathy
- Openness and flexibility in communication
- Communication skills required to fulfill job roles as specified by the organization
- Writing communications strategy
- Applying key elements of communications strategy

### Required Knowledge

The individual needs to demonstrate knowledge of:

- Communication process
- Dynamics of groups and different styles of group leadership
- Communication skills relevant to client groups
- Flexibility in communication
- Communication skills relevant to client groups
- Key elements of communications strategy

## EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Developed communication strategies to meet the organization requirements and applied in the workplace 1.2 Established and maintained communication pathways for effective communication in the workplace 1.3 Used communication strategies involving exchanges of complex oral information
2. Resource Implications	The following resources should be provided: 2.1 Access to relevant workplace or appropriately simulated environment where assessment can take place 2.2 Materials relevant to the proposed activity or tasks
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Direct Observation/Demonstration with Oral Questioning 3.2 Written Examination
4. Context of Assessment	Competency may be assessed individually in the actual workplace or through accredited institution
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

## DEMONSTRATE NUMERACY SKILLS

**UNIT CODE:** HO/OS/HP/BC/02/6

### UNIT DESCRIPTION

This unit describes the competencies required by a worker in order to apply a wide range of mathematical calculations for work; apply ratios, rates and proportions to solve problems; estimate, measure and calculate measurement for work; Use detailed maps to plan travel routes for work; Use geometry to draw and construct 2D and 3D shapes for work; Collect, organize and interpret statistical data; Use routine formula and algebraic expressions for work and use common functions of a scientific calculator

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
<p>These describe the key outcomes which make up workplace function.</p>	<p>These are assessable statements which specify the required level of performance for each of the elements.</p> <p><b><i>Bold and italicized terms are elaborated in the Range.</i></b></p>
<p>1. Apply a wide range of mathematical calculations for work</p>	<p>1.1 Mathematical information embedded in a range of workplace tasks and texts is extracted</p> <p>1.2 Mathematical information is interpreted and comprehended</p> <p>1.3 A range of mathematical and problem solving processes are select and used</p> <p>1.4 Different forms of fractions, decimals and percentages are flexibly used</p> <p>1.5 Calculation performed with positive and negative numbers</p> <p>1.6 Numbers are expressed as powers and roots and are used in calculations</p> <p>1.7 Calculations done using routine formulas</p> <p>1.8 Estimation and assessment processes are used to check outcome</p> <p>1.9 Mathematical language is used to discuss and explain the processes, results and implications of the task</p>
<p>2. Use and apply ratios, rates and proportions for work</p>	<p>2.1 Information regarding ratios, rates and proportions extracted from a range of workplace tasks and texts</p> <p>2.2 Mathematical information related to ratios, rate and proportions is analyzed</p> <p>2.3 Problem solving processes are used to undertake the task</p> <p>2.4 Equivalent ratios and rates are simplified</p> <p>2.5 Quantities are calculated using ratios, rates and proportions</p> <p>2.6 Graphs, charts or tables are constructed to represent ratios, rates and proportions</p> <p>2.6 The outcomes reviewed and checked</p> <p>2.7 Information is record using mathematical language and symbols</p>



<p>3. Estimate, measure and calculate measurement for work</p>	<p>3.1 Measurement information embedded in workplace texts and tasks are extracted and interpreted</p> <p>3.2 Appropriate workplace measuring equipment are identified and selected</p> <p>3.3 Accurate measurements are estimate and made</p> <p>3.4 The area of 2D shapes including compound shapes are calculated</p> <p>3.5 The volume of 3D shapes is calculated using relevant formulas</p> <p>3.6 Sides of right angled triangles are calculated using Pythagoras' theorem</p> <p>3.7 conversions are perform between units of measurement</p> <p>3.8 Problem solving processes are used to undertake the task</p> <p>3.9 The measurement outcomes are reviewed and checked</p> <p>3.10 Information is recorded using mathematical language and symbols appropriate for the task</p>
<p>4. Use detailed maps to plan travel routes for work</p>	<p>4.1 Different types of maps are identified and interpreted</p> <p>4.2 Key features of maps are identified</p> <p>4.3 Scales are identified and interpreted</p> <p>4.4 Scales are applied to calculate actual distances</p> <p>4.5 Positions or locations are determined using directional information</p> <p>4.6 Routes are planned by determining directions and calculating distances, speeds and times</p> <p>4.7 Information is gathered and identified and relevant factors related to planning a route checked</p> <p>4.8 Relevant equipment is select and checked for accuracy and operational effectiveness</p> <p>4.9 Task is planned and recorded using specialized mathematical language and symbols appropriate for the task</p>
<p>5. Use geometry to draw 2D shapes and construct 3D shapes for work</p>	<p>5.1 A range of 2D shapes and 3D shapes and their uses in work contexts is identified</p> <p>5.2 Features of 2D and 3D shapes are named and described</p> <p>5.3 Types of angles in 2D and 3D shapes are identified</p> <p>5.4 Angles are drawn, estimated and measured using geometric instruments</p> <p>5.5 Angle properties of 2D shapes are named and identified</p> <p>5.6 Angle properties are used to evaluate unknown angles in shapes</p> <p>5.7 Properties of perpendicular and parallel lines are applied to shapes</p> <p>5.8 Understanding and use of symmetry is demonstrated</p> <p>5.9 Understanding and use of similarity is demonstrated</p>

	<p>5.10 The workplace tasks and mathematical processes required are identified</p> <p>5.11 2D shapes is drawn for work</p> <p>5.12 3D shapes is constructed for work</p> <p>5.13 The outcomes are reviewed and checked</p> <p>5.14 Specialized mathematical language and symbols appropriate for the task are used</p>
6. Collect, organize, and interpret statistical data for work	<p>6.1 Workplace issue requiring investigation are identified</p> <p>6.2 Audience / population / sample unit is determined</p> <p>6.3 Data to be collected is identified</p> <p>6.4 Data collection method is selected</p> <p>6.5 Appropriate statistical data is collected and organized</p> <p>6.6 Data is illustrated in appropriate formats</p> <p>6.7 The effectiveness of different types of graphs are compared</p> <p>6.8 The summary statistics for collected data is calculated</p> <p>6.9 The results / findings are interpreted</p> <p>6.10 Data is checked to ensure that it meets the expected results and content</p> <p>6.11 Information from the results including tables, graphs and summary statistics is extracted and interpreted</p> <p>6.12 Mathematical language and symbols are used to report results of investigation</p>
7. Use routine formula and algebraic expressions for work	<p>7.1 Understanding of informal and symbolic notation, representation and conventions of algebraic expressions is demonstrated</p> <p>7.2 Simple algebraic expressions and equations are developed</p> <p>7.3 Operate on algebraic expressions</p> <p>7.4 Algebraic expressions are simplified</p> <p>7.5 Substitution into simple routine equations is done</p> <p>7.6 Routine formulas used for work tasks are identified and comprehended</p> <p>7.7 Routine formulas are evaluate by substitution</p> <p>7.8 Routine formulas transposed</p> <p>7.9 Appropriate formulas are identified and used for work related tasks</p> <p>7.10 Outcomes are checked and result of calculation used</p>
8. Use common functions of a scientific calculator for work	<p>8.1 Required numerical information to perform tasks is located</p> <p>8.2 The order of operations and function keys necessary to solve mathematical calculation are determined</p> <p>8.3 Function keys on a scientific calculator are identified and used</p> <p>8.4 Estimations are referred to check reasonableness of problem solving process</p> <p>8.5 Appropriate mathematical language, symbols and conventions</p>

	are used to report results
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### **RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

<b>Variable</b>	<b>Range</b>
1. Geometry	May include but not limited to: 2.1 Scale drawing 2.2 Triangles 2.3 Simple solid 2.4 Round 2.5 Square 2.6 Rectangular 2.7 Triangle 2.8 Sphere 2.9 Cylinder 2.10 Cube 2.11 Polygons 2.12 Cuboids

### **REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

#### **Required Skills**

The individual needs to demonstrate the following skills:

- Applying Fundamental operations (addition, subtraction, division, multiplication)
- Using calculator
- Using different measuring tools

#### **Required knowledge**

The individual needs to demonstrate knowledge of:

- Types of common shapes
- Differentiation between two dimensional shapes / objects
- Formulae for calculating area and volume
- Types and purpose of measuring instruments
- Units of measurement and abbreviations
- Fundamental operations (addition, subtraction, division, multiplication)
- Rounding techniques
- Types of fractions
- Different types of tables and graphs
- Meaning of graphs, such as increasing, decreasing, and constant value

- Preparation of basic data, tables & graphs

## DEMONSTRATE DIGITAL LITERACY

**UNIT CODE:** HO/OS/HP/BC/03/6

### UNIT DESCRIPTION

This unit covers the competencies required to effectively use digital devices such as smartphones, tablets, laptops and desktop PCs. It entails identifying and using digital devices such as smartphones, tablets, laptops and desktop PCs for purposes of communication, work performance and management at the work place.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
These describe the key outcomes which make up workplace function	These are assessable statements which specify the required level of performance for each of the elements. <i><b>Bold and italicized terms are elaborated in the Range</b></i>
1. Identify appropriate computer software and hardware	1.1 Concepts of ICT are determined in accordance with computer equipment 1.2 Classifications of computers are determined in accordance with manufacturers specification 1.3 <i><b>Appropriate computer software</b></i> are identified according to manufacturer's specification 1.4 <i><b>Appropriate computer hardware</b></i> are identified according to manufacturer's specification 1.5 Functions and commands of operating system are determined in accordance with manufacturer's specification
2. Apply security measures to data, hardware, software in automated environment	2.1 <i><b>Data security and privacy are classified</b></i> in accordance with the prevailing technology 2.2 <i><b>Security threats</b></i> are identified <i><b>and control measures</b></i> are applied in accordance with laws governing protection of ICT 2.3 Computer threats and crimes are detected. 2.4 Protection against computer crimes is undertaken in accordance with laws governing protection of ICT
3. Apply computer software in solving tasks	3.1 <i><b>Word processing concepts</b></i> are applied in resolving workplace tasks, report writing and documentation 3.2 <i><b>Word processing utilities</b></i> are applied in accordance with workplace procedures 3.3 Worksheet layout is prepared in accordance with work procedures 3.4 Worksheet is build and data manipulated in the worksheet in accordance with workplace procedures 3.5 Continuous data manipulated on worksheet is undertaken in accordance with work requirements 3.6 Database design and manipulation is undertaken in accordance with office procedures 3.7 Data sorting, indexing, storage, retrieval and security is provided in accordance with workplace procedures

4. Apply internet and email in communication at workplace	<p>4.1 Electronic mail addresses are opened and applied in workplace communication in accordance with office policy</p> <p>4.2 Office internet functions are defined and executed in accordance with office procedures</p> <p>4.3 <b>Network configuration</b> is determined in accordance with office operations procedures</p> <p>4.4 Official World Wide Web is installed and managed according to workplace procedures</p>
5. Apply Desktop publishing in official assignments	<p>5.1 Desktop publishing functions and tools are identified in accordance with manufactures specifications</p> <p>5.2 Desktop publishing tools are developed in accordance with work requirements</p> <p>5.3 Desktop publishing tools are applied in accordance with workplace requirements</p> <p>5.4 Typeset work is enhanced in accordance with workplace standards</p>
6. Prepare presentation packages	<p>6.1 Types of presentation packages are identified in accordance with office requirements</p> <p>6.2 Slides are created and formulated in accordance with workplace procedures</p> <p>6.3 Slides are edited and run in accordance with work procedures</p> <p>6.4 Slides and handouts are printed according to work requirements</p>

## RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
<b>Appropriate computer software</b> may include but not limited to:	A collection of instructions or computer tools that enable the user to interact with a computer, its hardware, or perform tasks.
<b>Appropriate computer hardware</b> may include but not limited to:	Collection of physical parts of a computer system such as; <ul style="list-style-type: none"> <li>• Computer case, monitor, keyboard, and mouse</li> <li>• All the parts inside the computer case, such as the hard disk drive, motherboard and video card</li> </ul>
<b>Data security and privacy</b> may include but not limited to:	<ul style="list-style-type: none"> <li>• Confidentiality of data</li> <li>• Cloud computing</li> <li>• Integrity -but-curious data surfing</li> </ul>
<b>Security and control measures</b> may include but not limited to:	<ul style="list-style-type: none"> <li>• Counter measures against cyber terrorism</li> <li>• Risk reduction</li> <li>• Cyber threat issues</li> <li>• Risk management</li> <li>• Pass-wording</li> </ul>
<b>Security threats</b> may include	<ul style="list-style-type: none"> <li>• Cyber terrorism</li> <li>• Hacking</li> </ul>

but not limited to:	
<b>Word processing concepts</b> may include but not limited to:	Using a special program to create, edit and print documents
<b>Network configuration</b> may include but not limited to:	Organizing and maintaining information on the components of a computer network

## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

### Required Skills

The individual needs to demonstrate the following skills:

- Analytical skills
- Interpretation
- Typing
- Communication
- Computing (applying fundamental operations such as addition, subtraction, division and multiplication)
- Using calculator
- Basic ICT skills

### Required Knowledge

The individual needs to demonstrate knowledge of:

- Software concept
- Functions of computer software and hardware
- Data security and privacy
- Computer security threats and control measures
- Technology underlying cyber attacks and networks
- Cyber terrorism
- Computer crimes
- Detection and protection of computer crimes
- Laws governing protection of ICT
- Word processing;
  - ✓ Functions and concepts of word processing.
  - ✓ Documents and tables creation and manipulations
  - ✓ Mail merging
  - ✓ Word processing utilities
- Spread sheets;
  - ✓ Meaning, formulae, function and charts, uses and layout
  - ✓ Data formulation, manipulation and application to cells
  - ✓
- Database;
  - ✓ Database design, data manipulation, sorting, indexing, storage retrieval and security

- Desktop publishing;
  - ✓ Designing and developing desktop publishing tools
  - ✓ Manipulation of desktop publishing tools
  - ✓ Enhancement of typeset work and printing documents
- Presentation Packages;
  - ✓ Types of presentation Packages
  - ✓ Creating, formulating, running, editing, printing and presenting slides and handouts
- Networking and Internet;
  - ✓ Computer networking and internet.
  - ✓ Electronic mail and world wide web
- Emerging trends and issues in ICT;
  - ✓ Identify and integrate emerging trends and issues in ICT
  - ✓ Challenges posed by emerging trends and issues

## EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: <ul style="list-style-type: none"> <li>1.1 Identified and controlled security threats</li> <li>1.2 Detected and protected computer crimes</li> <li>1.3 Applied word processing in office tasks</li> <li>1.4 Designed, prepared work sheet and applied data to the cells in accordance to workplace procedures</li> <li>1.5 Opened electronic mail for office communication as per workplace procedure</li> <li>1.6 Installed internet and World Wide Web for office tasks in accordance with office procedures</li> <li>1.7 Integrated emerging issues in computer ICT applications</li> <li>1.8 Applied laws governing protection of ICT</li> </ul>
2. Resource Implications	<ul style="list-style-type: none"> <li>2.1 Tablets</li> <li>2.2 Laptops</li> <li>2.3 Desktop PCs</li> <li>2.4 Calculator</li> <li>2.5 Internet</li> <li>2.6 Smart phone</li> <li>2.7 Operation Manuals</li> </ul>
3. Methods of Assessment	Competency may be assessed through: <ul style="list-style-type: none"> <li>3.1 Written Test</li> <li>3.2 Demonstration</li> <li>3.3 Practical assignment</li> <li>3.4 Interview/Oral Questioning</li> <li>3.5 Demonstration</li> </ul>
4. Context of Assessment	Competency may be assessed in an off and on the job setting



5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.
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## DEMONSTRATE ENTREPRENEURIAL SKILLS

UNIT CODE: HO/OS/HP/BC/04/6

### UNIT DESCRIPTION

This unit covers the outcomes required to build and develop the enterprise to be more competitive within a changing business environment, specifically responding to consumer demands while maintaining product quality and accessibility, building a customer base and employee motivation.

### ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
1. Develop business Innovative strategies	<p>1.1 Business innovation strategies are determined in accordance with the organization strategies</p> <p>1.2 Business innovative strategies are implemented for the purpose of business growth</p> <p>1.3 Track record and normative capability profile of enterprise and similar businesses are reviewed and considered in setting <i>strategic directions</i>.</p> <p>1.4 Strengths, weaknesses, opportunities and threats are considered when developing new ideas, approaches, goals and directions</p> <p><b>1.5</b> Decisions about enterprise strategies/directions are made after careful consideration of all relevant information</p> <p><b>1.6 <i>Business/corporate plan</i></b> is developed that sets out tactics, resource implications, timeframes, production and sales target</p>
2. Develop new products/markets	<p>2.1 Alternative product/service offerings are canvassed and studied for feasibility</p> <p>2.2 Potential and new sources/sellers of supplies and raw materials are identified and canvassed.</p> <p>2.3 Target markets and buyers are identified and surveyed as to their preferences and brand loyalties.</p>
3. Expand customers and product lines	<p>3.1 Enterprise is built up and sustained through responsiveness to market demands and the regulatory environment.</p> <p>3.2 Competitive advantage of existing products and services is maintained/enhanced through responsive advocacies and strategies.</p> <p>3.3 Constant listening to stakeholder/client feedback is ensured to maintain loyal client base.</p>

4. Motivate staff/workers	4.1 Regular dialogue is established and maintained in all levels and relevant sections of the enterprise 4.2 Flow of communications in both directions is encouraged 4.3 Helpful mechanisms and benefits are implemented 4.4 Issues/problems are proactively resolved through win-win solutions wherever practicable
5. Expand employed capital base	5.1 Capital employed in business is continuously reviewed as per the strategic plan 5.2 Business share holdings are reviewed in accordance with the type of business 5.3 Capital employed is expanded according to organization procedures 5.3 Types of shares are determined according to strategic plan 5.4 Shares diversification process is undertaken as per office procedures 5.5 Role of shareholders is determined and implemented in accordance organization procedures
6. Undertake county/ regional business expansion	6.1 Regions for expansion are continuously reviewed in accordance with strategic plan and company's expansion plan 6.2 County business regulations are reviewed and adhered to in accordance with set procedures 6.3 Regional laws and regulations are adhered to in accordance with set procedures 6.4 County/regional business expansion is undertaken in accordance with organization's growth/ expansion plan

### RANGE

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

Variable	Range
Strategic directions include but not limited to:	1.1 Business continuity and succession 1.2 Resource access security 1.3 Core competencies development 1.4 New developments e.g. technological change, new products
Business/Corporate plan include but not limited to:	2.1 Action steps and responsibilities of departments and individual workers 2.2 Resource requirements and budget 2.3 Tactics and strategies to achieve objectives

Helpful mechanisms include but not limited to:	3.1 Wage and non-wage benefits 3.2 Employee awards and recognition systems 3.3 Employee rights and welfare policies 3.4 Full-disclosure/transparency policies
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## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

### Required Skills

The individual needs to demonstrate the following skills:

- Assessing a range of alternative products and strategies
- Critically analyzing information, summarizing and making sense of previous and current market trends
- Identifying changing consumer preferences and demographics
- Thinking “outside the box”
- Ensuring quality consistency
- Reducing lead time to product/service delivery
- Managing operations/ production
- Using formal problem-solving procedures, e. g., root-cause analysis, six sigma
- Communication skills
- Applying motivational principles, e. g., positive stroking, behavior modification
- Assessing range of alternatives rather than choosing the easiest option
- Achieving ownership and credibility for the enterprise vision
- Critically analyzing information, summarizing and making sense of previous and current market trends
- Developing solutions and practical strategies which are “outside the box”

### Required Knowledge

The individual needs to demonstrate knowledge of:

- Features and benefits of common operational practices, e. g., continuous improvement (kaizen), waste elimination,
- Conflict resolution
- Health, safety and environment (HSE) principles and requirements
- Public-relations strategies
- Basic cost-benefit analysis
- Basic financial management
- Business strategic planning
- Impact of change on individuals, groups and industries
- Employee assistance
- Government and regulatory processes

- Local and international market trends
- Product promotion strategies
- Mechanisms in the enterprise
- Market and feasibility studies
- Local and global supply chains Business models and strategies
- Government and regulatory processes
- Local and international business environment
- Concepts of change management
- Relevant developments in other industries
- Capital employed
- Regional/ County business expansion
- Innovation in business

### **EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <p>1.1 Demonstrated ability to maintain a profitable and stable enterprise as shown by stakeholder feedback, employee testimonies and company financial statements</p> <p>1.2 Demonstrated ability to conceptualize and plan a micro/small enterprise</p> <p>1.3 Demonstrated ability to manage/operate a micro/small-scale business</p> <p>1.4 Demonstrated basic marketing skills</p>
2. Resource Implications	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> <li>• Interview guide for entrepreneurs</li> <li>• Enterprise workers and third parties</li> <li>• Materials and location relevant to the proposed activity and tasks</li> </ul>
3. Methods of Assessment	<ul style="list-style-type: none"> <li>• Case problems</li> <li>• Interview</li> <li>• Portfolio</li> <li>• Third part reports</li> </ul>
4. Context of Assessment	<ul style="list-style-type: none"> <li>• Competency may be assessed in workplace or in a simulated workplace setting</li> <li>• Assessment shall be observed while tasks are being undertaken whether individually or in-group</li> </ul>
5. Guidance	Holistic assessment with other units relevant to the

information for assessment	industry sector, workplace and job role is recommended.
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## DEMONSTRATE EMPLOYABILITY SKILLS

**UNIT CODE:** HO/OS/HP/BC/05/6

### UNIT DESCRIPTION

This unit covers competencies required to demonstrate employability skills. It involves competencies for exuding self-awareness and dealing with everyday life challenges; demonstrating critical safe work habits and leading a workplace team; planning and organizing work activities; applying learning, creativity and innovativeness in workplace functions; pursuing professional growth and managing time effectively in the workplace.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b>  These describe the key outcomes which make up workplace function.	<b>PERFORMANCE CRITERIA</b>  These are assessable statements which specify the required level of performance for each of the elements.  <i><b>Bold and italicized terms are elaborated in the Range</b></i>
1. Develop self-awareness and understanding of every day demands and challenges in the workplace	1.1 Personal vision, mission and goals are formulated based on potential and in relation to organization objectives 1.2 Emotions are managed as per workplace requirements 1.3 Thoughts, feelings and beliefs are expressed in direct, honest and appropriate ways. 1.4 Feelings are shared with others according to personal issues for healthy relations. 1.5 Individual performance is evaluated and monitored according to the agreed targets. 1.6 Assertiveness is developed and maintained based on the requirements of the job. 1.7 Own ideas and visions that generates excitement, enthusiasm and commitment are articulated. 1.8 Accountability and responsibility for own actions are demonstrated. 1.9 Self-esteem and a positive self-image are developed and maintained.

<p>2. Demonstrate critical safe work habits for employees in the workplace</p>	<p>2.1 Stress is managed at the workplace in accordance with workplace procedures.</p> <p>2.2 Punctuality and time consciousness is demonstrated in line workplace policy.</p> <p>2.3 Personal objectives are integrated with organization goals in accordance with organization’s strategic plan.</p> <p>2.4 Resources are effectively utilized in accordance with workplace policy.</p> <p>2.5 Work priorities are set and met in according to workplace procedures.</p> <p>2.6 Leisure time is recognized and used productively in line with organization policy.</p> <p>2.7 Abstinence from drug and substance abuse is demonstrated as per workplace policy.</p> <p>2.8 Awareness of HIV and AIDS is demonstrated in line with workplace requirements.</p> <p>2.9 Safety consciousness is demonstrated in the workplace based on organization safety policy.</p> <p>2.10 Emerging issues are dealt with in accordance with organization policy.</p>
<p>3. Lead a workplace team</p>	<p>3.1 Role and objectives of the team are determined in accordance workplace policy.</p> <p>3.2 Team parameters and relationships are identified according to set rules and regulations.</p> <p>3.3 Individual responsibilities are identified in accordance with work procedures.</p> <p>3.4 Effective and appropriate forms of communication in a team are established according to office policy.</p> <p>3.5 Business communication is carried out as per workplace place policy and requirements of the job.</p> <p>3.6 Team activities are complemented in accordance with office procedures.</p> <p>3.7 Team building activities are planned for in line with organization policy.</p> <p>3.8 Conflicts are resolved between team members in line with organization rules and regulations.</p> <p>3.9 <b>Gender mainstreaming</b> is undertaken in accordance with set regulations.</p> <p>3.10 Human rights are adhered to in accordance with existing protocol.</p> <p>3.11 Healthy relationships are developed and maintained for harmonious co-existence in line with workplace.</p>
<p>4. Plan and organize</p>	<p>4.1 Work schedules are developed for accomplishing given tasks</p>



work	<p>within the set time lines and based on workplace policy.</p> <p>4.2 Time is managed achieve workplace set goals and objectives.</p> <p>4.3 Clear project goals and deliverables are established according to company set policies and regulations.</p> <p>4.4 Resources are mobilized, allocated and utilized to meet project goals and deliverables.</p> <p>4.5 Work activities are monitored and evaluated in line with organization procedures.</p> <p>4.6 Situations that require decision making are identified within the work place and decision made in accordance with workplace policy.</p> <p>4.7 Steps required in making effective decisions are applied within the workplace.</p> <p>4.8 Problems arising in the course of working are identified and solved or reported according the workplace policies and procedures.</p> <p>4.9 Values required in problem solving process are demonstrated at the work place.</p> <p>4.10 Situations within the workplace that require negotiation identified and negotiations done to create win-win situations.</p> <p>4.11 Negotiation techniques are developed and applied at workplace to meet clientele’s satisfaction and organizations’ objectives.</p>
5. Maintain professional growth and development in the workplace	<p>5.1 Personal training needs are assessed and identified in line with the requirements of the job.</p> <p>5.2 <b>Training and career opportunities</b> are identified and availed based on job requirements.</p> <p>5.3 Resources for training are mobilized and allocated based organizations skills needs.</p> <p>5.4 Licenses and certifications relevant to job and career are obtained and renewed.</p> <p>5.5 Personal growth is pursued towards improving the qualifications set for the profession.</p> <p>5.6 Work priorities and commitments are managed based on requirement of the job and workplace policy.</p> <p>5.7 Recognitions are sought as proof of career advancement in line with professional requirements.</p>
6. Demonstrate learning, creativity and innovativeness in the workplace	<p>6.1 Time and effort is invested in learning new skills based job requirements.</p> <p>6.2 Willingness to learn in different context is demonstrated based on available learning opportunities arising in the</p>

	<p>workplace.</p> <p>6.3 Learning opportunities are sought and allocated based on job requirement and in line with organization policy.</p> <p>6.4 Application of learning is demonstrated in both technical and non-technical aspects based on requirements of the job.</p> <p>6.5 Application of a range of basic IT skills is demonstrated based on requirements of the job.</p> <p>6.6 Awareness of Occupational Health and Safety procedures are demonstrated in use of technology in the workplace.</p> <p>6.7 Initiative is taken to create more effective and efficient processes and procedures in line with workplace policy.</p> <p>6.8 New systems are developed and maintained in accordance with the requirements of the job.</p> <p>6.9 Opportunities that are not obvious are identified and exploited in line with organization objectives.</p> <p>6.10 Opportunities for performance improvement are identified proactively in area of work.</p> <p>6.11 Awareness of personal role in workplace innovation is demonstrated.</p>
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## RANGE

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

Variable	Range
<b><i>Drug and substance abuse</i></b> includes but not limited to:	<p>Commonly abused</p> <ul style="list-style-type: none"> <li>• Alcohol</li> <li>• Tobacco</li> <li>• Miraa</li> <li>• Over-the-counter drugs</li> <li>• Cocaine</li> <li>• Bhang</li> <li>• Glue</li> </ul>
<b><i>Feedback</i></b> includes but not limited to:	<ul style="list-style-type: none"> <li>• Verbal</li> <li>• Written</li> <li>• Informal</li> <li>• Formal</li> </ul>
<b><i>Clients</i></b> includes but not limited to:	<ul style="list-style-type: none"> <li>• New clients</li> <li>• Existing clients</li> <li>• Internal clients</li> <li>• External clients</li> </ul>

<b>Relationships</b> includes but not limited to:	<ul style="list-style-type: none"> <li>• Man/Woman</li> <li>• Trainer/trainee</li> <li>• Employee/employer</li> <li>• Client/service provider</li> <li>• Husband/wife</li> <li>• Boy/girl</li> <li>• Parent/child</li> <li>• Sibling relationships</li> </ul>
<b>Communication methods</b> include but not limited to:	<ul style="list-style-type: none"> <li>• Written</li> <li>• Talk/presentation</li> <li>• Video</li> <li>• Audio</li> <li>• Graphical</li> <li>• Modeling</li> </ul>
<b>Team</b> includes but not limited to:	<ul style="list-style-type: none"> <li>• Small work group</li> <li>• Staff in a section/department</li> <li>• Inter-agency group</li> </ul>
<b>Personal growth</b> includes but not limited to:	<ul style="list-style-type: none"> <li>• Growth in the job</li> <li>• Career mobility</li> <li>• Gains and exposure the job gives</li> <li>• Net workings</li> <li>• Benefits that accrue to the individual as a result of noteworthy performance</li> </ul>
<b>Personal objectives</b> includes but not limited to:	<ul style="list-style-type: none"> <li>• Long term</li> <li>• Short term</li> <li>• Broad</li> <li>• Specific</li> </ul>
<b>Trainings and career opportunities</b> includes but not limited to	<ul style="list-style-type: none"> <li>• Participation in training programs <ul style="list-style-type: none"> <li>○ Technical</li> <li>○ Supervisory</li> <li>○ Managerial</li> <li>○ Continuing Education</li> </ul> </li> <li>• Serving as Resource Persons in conferences and workshops</li> </ul>
<b>Resource</b> include but not limited to:	<ul style="list-style-type: none"> <li>• Human</li> <li>• Financial</li> <li>• Technology <ul style="list-style-type: none"> <li>○ Hardware</li> <li>○ Software</li> </ul> </li> </ul>
<b>Innovation</b> include but not limited to:	<ul style="list-style-type: none"> <li>• New ideas</li> <li>• Original ideas</li> <li>• Different ideas</li> <li>• Methods/procedures</li> <li>• Processes</li> <li>• New tools</li> </ul>
<b>Emerging issues</b> include but not limited to:	<ul style="list-style-type: none"> <li>• Terrorism</li> <li>• Social media</li> </ul>

	<ul style="list-style-type: none"><li>• National cohesion</li><li>• Open offices</li></ul>
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## **REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

### **Required Skills**

The individual needs to demonstrate the following skills:

- Personal hygiene practices
- Intra and Interpersonal skills
- Communication skills
- Knowledge management
- Interpersonal skills
- Critical thinking skills
- Observation skills
- Organizing skills
- Negotiation skills
- Monitoring skills
- Evaluation skills
- Record keeping skills
- Problem solving skills
- Decision Making skills
- Resource utilization skills
- Resource mobilization skills

### **Required Knowledge**

The individual needs to demonstrate knowledge of:

- Work values and ethics
- Company policies
- Company operations, procedures and standards
- Occupational Health and safety procedures
- Fundamental rights at work
- Personal hygiene practices
- Workplace communication
- Concept of time
- Time management
- Decision making
- Types of resources
- Work planning
- Resources and allocating resources
- Organizing work

- Monitoring and evaluation
- Record keeping
- Workplace problems and how to deal with them
- Negotiation
- Assertiveness
- Team work
- Gender mainstreaming
- HIV and AIDS
- Drug and substance abuse
- Leadership
- Safe work habits
- Professional growth and development
- Technology in the workplace
- Learning
- Creativity
- Innovation
- Emerging issues
  - Social media
  - Terrorism
  - National cohesion

## EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Attained job targets within key result areas.</li> <li>1.2 Maintained intra- and inter-personal relationship in the course of managing oneself.</li> <li>1.3 Completed trainings and career progression opportunities in time.</li> <li>1.4 Was punctual and time conscious.</li> <li>1.5 Acquired and maintained licenses and/or certifications required for the job.</li> <li>1.6 Planned and organized resources to achieve organization goals and objectives.</li> <li>1.7 Monitored and evaluated work activities.</li> <li>1.8 Identified, analyzed and solved problem arising in the course of working.</li> <li>1.9 Was conscious of health and safety while carrying out work functions.</li> <li>1.10 Maintained a mentorship and coaching program for employees.</li> <li>1.11 Innovatively made work processes and procedures more efficient.</li> <li>1.12 Mainstreamed gender issues in the workplace.</li> <li>1.13 Build a strong team of workers in the workplace.</li> <li>1.14 Sought and allocated learning opportunities and resources in the</li> </ul>
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	<p>workplace.</p> <p>1.15 Demonstrated awareness of HIV and AIDS.</p> <p>1.16 Abstained from drug and substance abuse.</p> <p>1.17 Demonstrated ability to cope with emerging issues.</p>
2. Resource Implications	<p>The following resources should be provided:</p> <p>2.1 Workplace or assessment location</p> <p>2.2 Case studies/scenarios</p>
3. Methods of Assessment	<p>Competency in this unit may be assessed through:</p> <ul style="list-style-type: none"> <li>• Oral Interview</li> <li>• Observation</li> <li>• Third Party Reports</li> <li>• Written</li> </ul>
4. Context of Assessment	<p>4.1 Competency may be assessed in workplace or in a simulated workplace setting</p> <p>4.2 Assessment shall be observed while tasks are being undertaken whether individually or in-group</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

## DEMONSTRATE ENVIRONMENTAL LITERACY

**UNIT CODE:** HO/OS/HP/BC/06/6

### UNIT DESCRIPTION

This unit specifies the competencies required to follow procedures for environmental hazard control, follow procedures for environmental pollution control, comply with workplace sustainable resource use, evaluate current practices in relation to resource usage, develop and adhere to environmental protection principles/strategies/guidelines, analyze resource use, develop resource conservation plans and implement selected plans.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b> These describe the key outcomes which make up workplace function.	<b>PERFORMANCE CRITERIA</b> These are assessable statements which specify the required level of performance for each of the elements. <i><b>Bold and italicized terms are elaborated in the Range</b></i>
1. Control environmental hazard	1.1 <i><b>Storage methods</b></i> for environmentally hazardous materials are strictly followed according to environmental regulations and OSHS. 1.2 <i><b>Disposal methods</b></i> of hazardous wastes are followed at all times according to environmental regulations and OSHS. 1.3 <i><b>PPE</b></i> is used according to OSHS.
2. Control environmental Pollution control	2.1 Environmental pollution <i><b>control measures</b></i> are compiled following standard protocol. 2.2 Procedures for solid waste management are observed according Environmental Management and Coordination Act 1999 2.3 Methods for minimizing <i><b>noise pollution</b></i> complied following environmental regulations.
3. Demonstrate sustainable resource use	3.1 Methods for minimizing wastage are complied with. 3.2 Waste management procedures are employed following principles of 3Rs (Reduce, Reuse, Recycle) 3.3 Methods for economizing or reducing resource consumption are practiced.
4. Evaluate current practices in relation to resource usage	4.1 Information on resource efficiency systems and procedures are collected and provided to the work group where appropriate. 4.2 Current resource usage is measured and recorded by members of the work group. 4.3 Current purchasing strategies are analyzed and recorded

	<p>according to industry procedures.</p> <p>4.4 Current work processes to access information and data is analyzed following enterprise protocol.</p>
5. Identify Environmental legislations/conventions for environmental concerns	<p>5.1 Environmental legislations/conventions and local ordinances are identified according to the different environmental aspects/impact</p> <p>5.2 Industrial standard/environmental practices are described according to the different environmental concerns</p>
6. Implement specific environmental programs	<p>6.1 Programs/Activities are identified according to organizations policies and guidelines.</p> <p>6.2 Individual roles/responsibilities are determined and performed based on the activities identified.</p> <p>6.3 Problems/constraints encountered are resolved in accordance with organizations' policies and guidelines</p> <p>6.4 Stakeholders are consulted based on company guidelines</p>
7. Monitor activities on Environmental protection/Programs	<p>7.1 Activities are periodically monitored and Evaluated according to the objectives of the environmental program</p> <p>7.2 Feedback from stakeholders are gathered and considered in Proposing enhancements to the program based on consultations</p> <p>7.3 Data gathered are analyzed based on Evaluation requirements</p> <p>7.4 Recommendations are submitted based on the findings</p> <p>7.5 Management support systems are set/established to sustain and enhance the program</p> <p>7.6 Environmental incidents are monitored and reported to concerned/proper authorities</p>
8. Analyze resource use	<p>8.1. All resource consuming processes are Identified</p> <p>8.2. Quantity and nature of Resource consumed is determined</p> <p>8.3. Resource flow is analyzed through different parts of the process.</p> <p>8.4. Wastes are classified for possible source of resources.</p>
9. Develop resource Conservation plans	<p>9.1. Efficiency of use/conversion of resources is determined following industry protocol.</p> <p>9.2. Causes of low efficiency of use of resources are Determined based on industry protocol.</p> <p>9.3. Plans for increasing the efficiency of resource use are developed based on findings.</p>

## RANGE



This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

<b>Variable</b>	<b>Range</b>
<b><i>PPE</i></b> May include but are not limited to	1.1 Mask 1.2 Gloves 1.3 Goggles 1.4 Safety hat 1.5 Overall 1.6 Hearing protector
<b><i>Environmental pollution control measures</i></b> may include but are not limited to:	2.1 Methods for minimizing or stopping spread and ingestion of airborne particles 2.2 Methods for minimizing or stopping spread and ingestion of gases and fumes 2.4 Methods for minimizing or stopping spread and ingestion of liquid wastes
<b><i>Wastes</i></b> may include but are not limited to:	3.1 Unnecessary waste 3.2 Necessary waste
<b><i>Waste management Procedures</i></b> may include but are not limited to:	4.1 Sorting 4.2 Storing of items 4.2 Recycling of items 4.3 Disposal of items
<b><i>Resources</i></b> may include but are not limited to:	5.1 Electric 5.2 Water 5.3 Fuel 5.4 Telecommunications 5.5 Supplies 5.6 Materials
<b><i>Workplace environmental hazards</i></b> may include but are not limited to:	6.1 Biological hazards 6.2 Chemical and dust hazards 6.3 Physical hazards
<b><i>Organizational systems and procedures</i></b> may include but are not limited to:	7.1 Supply chain, procurement and purchasing 7.2 Quality assurance 7.3 Making recommendations and seeking approvals
<b><i>Legislations/Conventions</i></b> may include but are not limited to:	8.1 EMCA 1999 8.2 Montreal Protocol 8.3 Kyoto Protocol

<b><i>Environmental aspects/impacts</i></b> may include but are not limited to:	<ul style="list-style-type: none"> <li>9.1 Air pollution</li> <li>9.2 Water pollution</li> <li>9.3 Noise pollution</li> <li>9.4 Solid waste</li> <li>9.5 Flood control</li> <li>9.6 Deforestation/Denudation</li> <li>9.7 Radiation/Nuclear /Radio Frequency/ Microwaves</li> <li>9.8 Situation</li> <li>9.9 Soil erosion (e.g. Quarrying, Mining, etc.)</li> <li>9.10 Coral reef/marine life protection</li> </ul>
<b><i>Industrial standards / Environmental practices</i></b> may include but are not limited to:	<ul style="list-style-type: none"> <li>10.1 ISO standards</li> <li>10.2 Company environmental management systems (EMS)</li> </ul>
<b><i>Periodic</i></b> may include but are not limited to:	<ul style="list-style-type: none"> <li>11.1 hourly</li> <li>11.2 daily</li> <li>11.3 weekly</li> <li>11.4 monthly</li> <li>11.5 quarterly</li> <li>11.6 yearly</li> </ul>
<b><i>Programs/Activities</i></b> may include but are not limited to:	<ul style="list-style-type: none"> <li>12.1 Waste disposal (on-site and off-site)</li> <li>12.2 Repair and maintenance of equipment</li> <li>12.3 Treatment and disposal operations</li> <li>12.4 Clean-up activities</li> <li>12.5 Laboratory and analytical test</li> <li>12.6 Monitoring and evaluation</li> <li>12.7 Environmental advocacy programs</li> </ul>

## EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

<p>1. Critical Aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Controlled environmental hazard</li> <li>1.2 Controlled environmental pollution</li> <li>1.3 Demonstrated sustainable resource use</li> <li>1.4 Evaluated current practices in relation to resource usage</li> <li>1.5 Demonstrated knowledge of environmental legislations and local ordinances according to the different environmental issues /concerns.</li> <li>1.6 Described industrial standard environmental practices according to the different environmental issues/concerns.</li> <li>1.7 Resolved problems/ constraints encountered based on management standard procedures</li> </ul>
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	<p>1.8 Implemented and monitored environmental practices on a periodic basis as per company guidelines</p> <p>1.9 Recommended solutions for the improvement of the program</p> <p>1.10 Monitored and reported to proper authorities any environmental incidents</p>
2. Resource Implications	<p>The following resources should be provided:</p> <p>2.1 Workplace with storage facilities</p> <p>2.2 Tools, materials and equipment relevant to the tasks (e.g. Cleaning tools, cleaning materials, trash bags)</p> <p>2.3 PPE, manuals and references</p> <p>2.4 Legislation, policies, procedures, protocols and local ordinances relating to environmental protection</p> <p>2.5 Case studies/scenarios relating to environmental Protection</p>
3 Methods of Assessment	<p>Competency in this unit may be assessed through:</p> <p>3.1 Demonstration</p> <p>3.2 Oral questioning</p> <p>3.3 Written examination</p> <p>3.4 Interview/Third Party Reports</p> <p>3.5 Portfolio (citations/awards from GOs and NGOs, certificate of training – local and abroad)</p> <p>3.6 Simulations and role-play</p>
4 Context of Assessment	<p>Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.</p>
5 Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

### Required Skills

The individual needs to demonstrate the following skills:

- Following storage methods of environmentally hazardous materials
- Following disposal methods of hazardous wastes
- Using PPE
- Practicing OSHS
- Complying environmental pollution control
- Observing solid waste management
- Complying methods of minimizing noise Pollution

- Complying methods of minimizing wastage
- Employing waste management procedures
- Economizing resource consumption
- Listing of resources used
- Measuring current usage of resources
- Identifying and reporting workplace environmental hazards
- Conveying all environmental issues
- Following environmental regulations
- Identifying environmental regulations
- Assessing procedures for assessing compliance
- Collecting information on environmental and resource efficiency systems and procedures, and Providing information to the work group
- Measuring and recording current resource usage
- Analysing and recording current purchasing strategies.
- Analysing current work processes to access information and data and Assisting identifying areas for improvement
- Analysing resource flow
- Determining efficiency of use/conversion of resources
- Determining causes of low efficiency of use
- Developing plans for increasing the efficiency of resource use
- Checking resource use plans
- Complying to regulations/licensing requirements
- Determining benefit/cost of plans
- Ranking proposals based on benefit/cost compared to limited resources
- Checking proposals meet regulatory requirements
- Monitoring implementation
- Making adjustments to plan and implementation
- checking new resource usage

### **Required Knowledge**

The individual needs to demonstrate knowledge of:

- Storage methods of environmentally hazardous materials
- Disposal methods of hazardous wastes
- Usage of PPE Environmental regulations
- OSHS
- Types of pollution
- Environmental pollution control measures
- Different solid wastes
- Solid waste management
- Different noise pollution
- Methods of minimizing noise pollution

- Methods of minimizing wastage
- Waste management procedures
- Economizing of resource consumption
- Principle of 3Rs
- Types of resources
- Techniques in measuring current usage of resources
- Calculating current usage of resources
- Types of workplace environmental hazards
- Environmental regulations
- Environmental regulations applying to the enterprise.
- Procedures for assessing compliance with environmental regulations.
- Collection of information on environmental and resource efficiency systems and procedures,
- Measurement and recording of current resource usage
- Analysis and recording of current purchasing strategies.
- Analysis current work processes to access information and data Analysis of data and information
- Identification of areas for improvement
- Resource consuming processes
- Determination of quantity and nature of resource consumed
- Analysis of resource flow of different parts of the resource flow process
- Use/conversion of resources
- Causes of low efficiency of use
- Increasing the efficiency of resource use
- Inspection of resource use plans
- Regulations/licensing requirements
- Determine benefit/cost for alternative resource sources
- Benefit/costs for different alternatives
- Components of proposals
- Criteria on ranking proposals
- Regulatory requirements
- Proposals for improving resource efficiency
- Implementation of resource efficiency plans
- Procedures in monitor implementation
- Adjustments of implementation plan
- Inspection of new resource usage

## DEMONSTRATE OCCUPATIONAL SAFETY AND HEALTH PRACTICES

**UNIT CODE:** HO/OS/HP/BC/07/6

### UNIT DESCRIPTION

This unit specifies the competencies required to lead the implementation of workplace's safety and health program, procedures and policies/guidelines.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b> These describe the key outcomes which make up workplace function.	<b>PERFORMANCE CRITERIA</b> These are assessable statements which specify the required level of performance for each of the elements. <i><b>Bold and italicized terms are elaborated in the Range</b></i>
3.1 Identify workplace hazards and risk	1.1 <i><b>Hazards</b></i> in the workplace and/or its <i><b>indicators</b></i> of its presence, are identified 1.2 <i><b>Evaluation and/or work environment</b></i> measurements of OSH hazards/risk existing in the workplace is conducted by Authorized personnel or agency 1.3 <i><b>OSH issues and/or concerns</b></i> raised by workers are Gathered
3.2 Identify and implement appropriate control measures	2.1 <i><b>Prevention and control measures</b></i> , including use of <i><b>safety gears / PPE (personal protective equipment)</b></i> for specific hazards identified and implemented 2.2 <i><b>Appropriate risk controls</b></i> based on result of OSH hazard evaluation is recommended. 2.3 <i><b>Contingency measures</b></i> , including <i><b>emergency procedures</b></i> during workplace <i><b>incidents and emergencies</b></i> are recognized and established in accordance with organization procedures.
3.3 Implement OSH programs, procedures and policies/ guidelines	3.1 Information to work team about company OSH program, procedures and policies/guidelines are provided 3.2 Implementation of OSH procedures and policies/ guidelines are participated 3.3 Team members are trained and advised on OSH standards and procedures 3.4 Procedures for maintaining <i><b>OSH-related records</b></i> are implemented

### RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
1. <b>Hazards may include</b> but are not limited to:	1.1. Physical hazards – impact, illumination, pressure, noise, vibration, extreme temperature, radiation 1.2 Biological hazards- bacteria, viruses, plants, parasites, mites, molds, fungi, insects 1.3 Chemical hazards – dusts, fibers, mists, fumes, smoke, gasses, vapors 1.4 Ergonomics Psychological factors – over exertion/ excessive force, awkward/static positions, fatigue, direct pressure, varying metabolic cycles Physiological factors – monotony, personal relationship, work out cycle 1.6 Safety hazards (unsafe workplace condition) – confined space, excavations, falling objects, gas leaks, electrical, poor storage of materials and waste, spillage, waste and debris 1.7 Unsafe workers’ act (Smoking in off-limited areas, Substance and alcohol abuse at work)
2. <b>Indicators may include</b> but are not limited to:	2.1 Increased of incidents of accidents, injuries 2.2 Increased occurrence of sickness or health complaints/ symptoms 2.3 Common complaints of workers’ related to OSH 2.4 High absenteeism for work-related reasons
3. <b>Evaluation and/or work environment measurements</b> may include but are not limited to:	3.1 Health Audit 3.2 Safety Audit 3.3 Work Safety and Health Evaluation 3.4 Work Environment Measurements of Physical and Chemical Hazards
4. <b>OSH issues and/or concerns</b> may include but are not limited to:	4.1 Workers’ experience/observance on presence of work hazards 4.2 Unsafe/unhealthy administrative arrangements (prolonged work hours, no break time, constant overtime, scheduling of tasks) 4.3 Reasons for compliance/non-compliance to use of PPEs or other OSH procedures/policies/guidelines

<p>5. <b>Prevention and control measures</b> may include but are not limited to:</p>	<p>5.1 Eliminate the hazard (i.e., get rid of the dangerous machine)</p> <p>5.2 Isolate the hazard (i.e. keep the machine in a closed room and operate it remotely; barricade an unsafe area off)</p> <p>5.3 Substitute the hazard with a safer alternative (i.e., replace the machine with a safer one)</p> <p>5.4 Use administrative controls to reduce the risk (i.e. give trainings on how to use equipment safely; OSH-related topics, issue warning signages, rotation/shifting work schedule)</p> <p>5.5 Use engineering controls to reduce the risk (i.e. use safety guards to machine)</p> <p>5.6 Use personal protective equipment</p> <p>5.7 Safety, Health and Work Environment Evaluation</p> <p>5.8 Periodic and/or special medical examinations of workers</p>
<p>6. <b>Safety gears /PPE (Personal Protective Equipment)</b> may include but are not limited to:</p>	<p>6.1 Arm/Hand guard, gloves</p> <p>6.2 Eye protection (goggles, shield)</p> <p>6.3 Hearing protection (ear muffs, ear plugs)</p> <p>6.4 Hair Net/cap/bonnet</p> <p>6.5 Hard hat</p> <p>6.6 Face protection (mask, shield)</p> <p>6.7 Apron/Gown/coverall/jump suit</p> <p>6.8 Anti-static suits</p> <p>6.9 High-visibility reflective vest</p>
<p>7. <b>Appropriate risk controls</b></p>	<p>Appropriate risk controls in order of impact are as follows:</p> <p>7.1 Eliminate the hazard altogether (i.e., get rid of the dangerous machine)</p> <p>7.2 Isolate the hazard from anyone who could be harmed (i.e., keep the machine in a closed room and operate it remotely; barricade an unsafe area off)</p> <p>7.3 Substitute the hazard with a safer alternative (i.e., replace the machine with a safer one)</p> <p>7.4 Use administrative controls to reduce the risk (i.e., train workers how to use equipment safely; train workers about the risks of harassment; issue signage)</p> <p>7.5 Use engineering controls to reduce the risk (i.e., attach guards to the machine to protect users)</p> <p>7.6 Use personal protective equipment (i.e., wear gloves and goggles when using the machine)</p>
<p>8. <b>Contingency measures</b> may include but are not limited to:</p>	<p>8.1 Evacuation</p> <p>8.2 Isolation</p> <p>8.3 Decontamination</p> <p>8.4 (Calling designed) emergency personnel</p>



<p>9. <b>Emergency procedures</b> may include but are not limited to:</p>	<p>9.1 Fire drill  9.2 Earthquake drill  9.3 Basic life support/CPR  9.4 First aid  9.5 Spillage control  9.6 Decontamination of chemical and toxic  9.7 Disaster preparedness/management  9.8 use of fire-extinguisher</p>
<p>10. <b>Incidents and emergencies</b> may include but are not limited to:</p>	<p>10.1 Chemical spills  10.2 Equipment/vehicle accidents  10.3 Explosion  10.4 Fire  10.5 Gas leak  10.6 Injury to personnel  10.7 Structural collapse  10.8 Toxic and/or flammable vapours emission.</p>
<p>11. <b>OSH-related Records</b> may include but are not limited to:</p>	<p>11.1 Medical/Health records  11.2 Incident/accident reports  11.3 Sickness notifications/sick leave application  11.4 OSH-related trainings obtained</p>

## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

### Required Skills

The individual needs to demonstrate the following skills:

- Skills on preliminary identification of workplace hazards/risks
- Knowledge management
- Critical thinking skills
- Observation skills
- Coordinating skills
- Communication skills
- Interpersonal skills
- Troubleshooting skills
- Presentation skills
- Training skills

### Required Knowledge

The individual needs to demonstrate knowledge of:

- General OSH Principles
- Occupational hazards/risks recognition

- OSH organizations providing services on OSH evaluation and/or work environment measurements (WEM)
- National OSH regulations; company OSH policies and protocols
- Systematic gathering of OSH issues and concerns
- General OSH principles
- National OSH regulations
- Company OSH and recording protocols , procedures and policies/guidelines
- Training and/or counseling methodologies and strategies

## EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical Aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Identifies hazards/risks in the workplace and/or its indicators</li> <li>1.2 Requests for evaluation and/or work environment measurements of OSH hazards/risk in the workplace</li> <li>1.3 Gathers OSH issues and/or concerns raised by workers</li> <li>1.4 Identifies and implements prevention and control measures, including use of PPE (personal protective equipment) for specific hazards</li> <li>1.5 Recommends appropriate risk controls based on result of OSH hazard evaluation and OSH issues gathered</li> <li>1.6 Establish contingency measures, including emergency procedures in accordance with organization procedures</li> <li>1.7 Provides information to work team about company OSH program, procedures and policies/guidelines</li> <li>1.8 Participates in the implementation of OSH procedures and policies/guidelines</li> <li>1.9 Trains and advises team members on OSH standards and procedures</li> <li>1.10 Implements procedures for maintaining OSH-related records</li> </ul>
2. Resource Implications	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> <li>2.1 Workplace or assessment location</li> <li>2.2 OSH personal records</li> <li>2.3 PPE</li> <li>2.4 Health records</li> </ul>
3. Methods of Assessment	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> <li>3.1 Portfolio Assessment</li> <li>3.2 Interview</li> <li>3.3 Case Study/Situation</li> </ul>

	3.4 Observation/Demonstration and oral questioning
4. Context of Assessment	Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

## **CORE UNITS OF COMPETENCY**

## PRODUCE TROPICAL FRUITS

**UNIT CODE:** HO/OS/HP/CR/01/6

### UNIT DESCRIPTION

This unit specifies the competencies required to produce tropical fruits. It includes preparing tropical fruits orchard, producing tropical fruits, harvesting tropical fruits, determining productivity and quality of fruits produced, carrying out post-harvest handling of the fruits and generating production report.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
<p>These describe the key outcomes which make up workplace function.</p>	<p>These are assessable statements which specify the required level of performance for each of the elements. <i><b>Bold and italicized terms are elaborated in the range.</b></i></p>
<p>1. Prepare to produce tropical fruits</p>	<p>1.1 <b><i>Tropical fruits</i></b> to be established are determined in accordance with <b><i>Agro Ecological Zone (AEZ)</i></b>, farm plan and market demand            1.2 <b>Orchard</b> site is selected based on fruit chosen and the farm plan            1.3 <b><i>Tools, equipment, materials and supplies</i></b> are identified and sourced based on the type of fruit to be established            1.4 Soil for analysis is sampled as per <b><i>soil sampling procedure</i></b>            1.5 Soil erosion is controlled based on topography, soil type and level of degradation.            1.6 Orchard/land is prepared according to <b><i>agronomic requirements</i></b> of the fruit            1.7 Planting materials are sourced in accordance with procurement procedures, <b><i>phyto-sanitary requirements</i></b> and the size of the orchard to be established            1.8 Planting holes for tropical fruit seedlings are prepared based on agronomic requirements, <b><i>Good Agricultural Practices (GAP)</i></b> and MoALF fruits production manual</p>
<p>2. Produce tropical fruits</p>	<p>2.1 Seedlings are planted based on agronomic requirements            2.2 Planted tropical fruit seedlings are pruned as per agronomic requirements            2.3 Orchard is protected from weeds, pests and diseases as per GAP            2.4 Established tropical fruit trees are fed based on soil analysis report            2.5 Established tropical fruit trees are watered, mulched and trained according to environmental conditions and growth habits            2.6 Physiological disorders in the tropical fruit trees are managed as per the MoALF fruits production manual            2.7 Tropical fruit trees are induced to flower as per GAP and fruit tree type            2.8 Tropical fruits are harvested in accordance with MoALF fruits production manual</p>
<p>3. Evaluate</p>	<p>3.1 Quality of tropical fruits is assessed based on <b><i>fruit quality</i></b></p>

production of tropical fruits	<p><i>parameters</i> and MoALF fruits production manual</p> <p>3.2 Quantity of fruits produced is assessed based on MoALF production manual</p> <p>3.3 Return on investment is determined as per accounting principles</p> <p>3.4 Recommendations are made based on evaluation report.</p>
4. Complete production of tropical fruits	<p>4.1 Post harvest handling of the tropical fruits is carried out as per MoALF production manual</p> <p>4.2 Tropical fruits production report is generated in accordance with the production procedures</p> <p>4.3 Tropical fruits production report is shared according to farm policies</p> <p>4.4 Waste management is undertaken in accordance with Environmental Management and Coordination Act (EMCA)</p>

## RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

Variable	Range
<i>Tropical fruits</i> includes but not limited to:	<p>Varieties of :</p> <ul style="list-style-type: none"> <li>• Mangoes</li> <li>• Oranges</li> <li>• Papaya</li> <li>• Pineapple</li> <li>• Custard</li> <li>• Avocado</li> <li>• Bananas</li> </ul>
<i>Tools</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Hoes</li> <li>• Machetes</li> <li>• Secateurs</li> <li>• Shovels</li> <li>• Soil augur</li> <li>• Panga</li> <li>• Pegs</li> <li>• Hammer</li> <li>• Saw</li> <li>• Bucket</li> <li>• Secateurs</li> <li>• Shears</li> <li>• Dibbler</li> <li>• Pegs</li> </ul>
<i>Equipment</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Spray pumps</li> <li>• Watering cans</li> <li>• Hose pipes</li> <li>• Plough</li> </ul>

	<ul style="list-style-type: none"> <li>• Harrows</li> <li>• Ridges</li> <li>• Boom sprayer</li> <li>• Pruning saw</li> <li>• Wire strainer</li> <li>• Traps</li> <li>• Pipe sprinklers</li> <li>• Scouting flags</li> <li>• Storage tanks</li> <li>• Tractors</li> <li>• Grading shed</li> <li>• Bud count square</li> <li>• Meteorological equipment</li> </ul>
<p><b><i>Materials and Supplies</i></b> includes but not limited to:</p>	<ul style="list-style-type: none"> <li>• Pesticides</li> <li>• Fertilizers</li> <li>• Stationery</li> <li>• Manures</li> <li>• Seedlings /planting materials</li> <li>• Khaki paper bags size 3</li> <li>• Rope</li> <li>• Nets</li> <li>• Translucent papers</li> <li>• Papers</li> <li>• Fencing wire</li> <li>• Staking sticks</li> <li>• Nails</li> <li>• Herbicides</li> <li>• Pesticides</li> <li>• Pheromones</li> </ul>
<p><b><i>Soil sampling procedure</i></b> includes but not limited to:</p>	<p>The process of:</p> <ul style="list-style-type: none"> <li>• soil collection</li> <li>• packaging and</li> <li>• submission for analysis</li> </ul>
<p><b><i>Agronomic requirements</i></b> include but not limited to:</p>	<ul style="list-style-type: none"> <li>• Growing cycle and growing period</li> <li>• Radiation</li> <li>• Temperature</li> <li>• Rooting</li> <li>• Aeration</li> <li>• Water quantity and quality</li> <li>• Nutrients</li> <li>• Salinity</li> <li>• Pests</li> <li>• Diseases</li> <li>• Weeds</li> <li>• Wind</li> </ul>
<p><b><i>Phyto-sanitary requirements</i></b></p>	<ul style="list-style-type: none"> <li>• Rules on use of agro-chemicals on fruits</li> </ul>

includes but not limited to:	<ul style="list-style-type: none"> <li>• Use of additives on fruits</li> <li>• Rules maximum levels of agro-chemical residues in fruits</li> <li>• Rules on marketing and labelling of fruits</li> <li>• Rules on materials intended to come into contact with fruits</li> <li>• Rules on certification of fruit producers</li> </ul>
<i>Planting materials</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Seeds</li> <li>• seedlings</li> <li>• splits</li> <li>• crowns</li> <li>• slips</li> <li>• Cuttings</li> <li>• Suckers</li> <li>• Tissue culture</li> </ul>
<i>Good Agricultural Practices (GAP)</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Field hygiene</li> <li>• Selection of clean planting materials</li> <li>• Safe use of agro-chemicals</li> <li>• Maximum Residual Levels of agro-chemicals used</li> <li>• Environmental sustainability</li> </ul>
<i>Fruit quality parameters</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Fruit Color</li> <li>• Fruit skin texture</li> <li>• Uniformity</li> <li>• Presence or absence of damage from bruises or pests on pests</li> </ul>

## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

### Required skills

The individual needs to demonstrate the following skills:

- Tilling
- Measuring
- Leveling
- Gaping
- Pruning
- Spraying
- Pests , diseases and nutrients deficiency scouting
- Equipment calibration
- Technical Report writing
- Produce handling
- Soil sampling
- Observation
- Negotiation
- Digital literacy

### Required knowledge

The individual needs to demonstrate knowledge of:

- Sources of quality water



- Agro Ecological Zonation
- Tropical fruit orchard establishment and management
- Types of tropical fruits
- Physiology of sub-tropical fruits
- Types of tools and equipment used in production of tropical fruits
- Soil sampling and testing
- Soil conservation
- Phyto-sanitary requirements
- Good Agricultural Practices
- Sources of quality planting materials for tropical fruit trees
- Husbandry practices in tropical fruit production
- Tropical fruit production Technologies
- Flower induction
- Maturity indices in tropical fruits
- Harvesting and Post Harvesting Handling of tropical fruits
- Accounting principles
- Production records and reports
- Waste Management
- Occupational Safety and Health Procedures
- General management of tropical fruit production farm

### **EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

<p>1. Critical Aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Prepared planting land to a level suitable to the planting material</li> <li>1.2 Sourced planting materials adequate for the prepared land</li> <li>1.3 Observed safety measures by using Personal Protective Equipment (PPE ) and correct tools</li> <li>1.4 Established fruits suitable for the Agro Ecological zone, market demand</li> <li>1.5 Followed required process of producing fruits</li> <li>1.6 Efficiently used the inputs</li> <li>1.7 Harvested and carried out post-harvest handling of tropical fruits</li> </ul>
<p>2. Resource Implications (required for assessment )</p>	<p>The following resources must be provided during assessment :</p> <ul style="list-style-type: none"> <li>2.1. Assessment location</li> <li>2.2. Farm plan</li> <li>2.3. Soil sampling guideline</li> <li>2.4. Procurement policy</li> <li>2.5. Good Agricultural Practices manual</li> <li>2.6. MoALF fruits Production manual</li> </ul>

	2.8. Farm policy
3. Methods of Assessment	Competency may be assessed through: 3.1 Observation 3.2 Written tests 3.3 Oral questioning
4. Context of Assessment	Competency may be assessed: 4.1 Off-the-job 4.2 On-the-job 4.3 Work placement -attachment  Off the job assessment must be undertaken in a closely simulated workplace environment.
5. Guidance information for assessment	What can be assessed in holistic assessment (with other units relevant to the industry sector, workplace and job roles) is recommended. Attitude is assessed alongside production of tropical fruits.

## PRODUCE SUB-TROPICAL FRUITS

**UNIT CODE:** HO/OS/HP/CR/02/6

### UNIT DESCRIPTION

This unit specifies the competencies required to produce tropical fruits. It includes preparing sub-tropical fruits orchard, producing sub-tropical fruits, harvesting sub-tropical fruits, determining productivity and quality of fruits produced, carrying out post-harvest handling of the fruits and generating production report.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b> These describe the key outcomes which make up workplace function.	<b>PERFORMANCE CRITERIA</b> These are assessable statements which specify the required level of performance for each of the elements. <i><b>Bold and italicized terms are elaborated in the range.</b></i>
1. Prepare to produce sub-tropical fruits	1.1 <i><b>Sub-tropical fruits</b></i> to be establish are determined in accordance with <i><b>Agro Ecological Zone (AEZ)</b></i> , farm plan and market demand 1.2 <b>Orchard</b> site is selected based on fruit tree chosen and the farm plan 1.3 <i><b>Tools, equipment, materials and supplies</b></i> are identified and sourced based on the type of fruit to be established 1.4 Soil for analysis is sampled as per <i><b>soil sampling procedure</b></i> 1.5 Soil erosion is controlled based on topography, soil type and level of degradation. 1.6 Orchard / Land is prepared according to <i><b>agronomic requirements</b></i> of the fruit 1.7 Planting materials are sourced in accordance with procurement procedures, <i><b>phyto-sanitary requirements</b></i> and the size of the orchard to be established 1.8 Planting holes for sub-tropical fruit seedlings are prepared based on agronomic requirements, <i><b>Good Agricultural Practices (GAP)</b></i> and MoALF fruits production manual
2. Produce sub-tropical fruits	2.1 Seedlings are planted based on agronomic requirements 2.2 Planted sub-tropical fruit seedlings are pruned as per agronomic requirements 2.3 Orchard is protected from weeds, pests and diseases as per GAP 2.4 Established sub-tropical fruit trees are fed based on soil analysis report 2.5 Established sub-tropical fruit trees are watered, mulched and trained according to environmental conditions and growth habits 2.6 Physiological disorders in the sub-tropical fruit trees are managed as per the MoALF fruits production manual 2.7 Sub-tropical fruit trees are induced to flower as per GAP and fruit tree type 2.8 Sub-tropical fruits are harvested in accordance with the MoALF

	fruits production manual
3. Evaluate production of sub-tropical fruits	<p>3.1 Quality of Sub-tropical fruits is assessed based on <i>fruit quality parameters</i> and MoALF fruits production manual</p> <p>3.2 Quantity of fruits produced is assessed based on MoALF production manual</p> <p>3.3 Return on investment is determined as per accounting principles</p> <p>3.4 3.4 Recommendations are made based on evaluation report.</p>
4. Complete production of sub-tropical fruits	<p>4.1 Post harvest handling of the sub-tropical fruits is carried out as per MoALF production manual</p> <p>4.2 Sub-tropical fruits production report is generated in accordance with the production procedures</p> <p>4.3 Sub-tropical fruits production report is shared according to farm policies</p> <p>4.4 Waste management is undertaken in accordance with Environmental Management and Coordination Act (EMCA)</p>

### RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

Variable	Range
<i>Sub-tropical fruits</i> includes but not limited to:	Varieties of : <ul style="list-style-type: none"> <li>• Tree tomatoes</li> <li>• straw berry</li> <li>• guava</li> <li>• loquat</li> <li>• lime</li> <li>• white sapote</li> </ul>
<i>Tools</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Hoes</li> <li>• Machetes</li> <li>• Secateurs</li> <li>• Shovels</li> <li>• Soil augur</li> <li>• Panga</li> <li>• Pegs</li> <li>• Hammer</li> <li>• Saw</li> <li>• Bucket</li> <li>• Secateurs</li> <li>• Shears</li> <li>• Dibbler</li> <li>• Pegs</li> </ul>

<p><b>Equipment</b> includes but not limited to:</p>	<ul style="list-style-type: none"> <li>• Spray pumps</li> <li>• Watering cans</li> <li>• Hose pipes</li> <li>• Plough</li> <li>• Harrows</li> <li>• Ridges</li> <li>• Boom sprayer</li> <li>• Pruning saw</li> <li>• Wire strainer</li> <li>• Traps</li> <li>• Pipe sprinklers</li> <li>• Scouting flags</li> <li>• Storage tanks</li> <li>• Tractors</li> <li>• Grading shed</li> <li>• Bud count square</li> <li>• Meteorological equipment</li> </ul>
<p><b>Materials and Supplies</b> includes but not limited to:</p>	<ul style="list-style-type: none"> <li>• Pesticides</li> <li>• Fertilizers</li> <li>• Stationery</li> <li>• Manures</li> <li>• Seedlings /planting materials</li> <li>• Khaki paper bags size 3</li> <li>• Rope</li> <li>• Nets</li> <li>• Translucent papers</li> <li>• Papers</li> <li>• Fencing wire</li> <li>• Staking sticks</li> <li>• Nails</li> <li>• Herbicides</li> <li>• Pesticides</li> <li>• Pheromones</li> </ul>
<p><b>Soil sampling procedure</b> includes but not limited to:</p>	<p>The process of</p> <ul style="list-style-type: none"> <li>• soil collection,</li> <li>• packaging and</li> <li>• submission for analysis</li> </ul>
<p><b>Agronomic requirements</b> include but not limited to:</p>	<ul style="list-style-type: none"> <li>• Growing cycle and growing period</li> <li>• Radiation</li> <li>• Temperature</li> <li>• Rooting</li> <li>• Aeration</li> <li>• Water quantity and quality</li> <li>• Nutrients</li> <li>• Salinity</li> <li>• Pests</li> </ul>

	<ul style="list-style-type: none"> <li>• Diseases</li> <li>• Weeds</li> <li>• Wind</li> </ul>
<i>Phyto-sanitary requirements</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Rules on use of agro-chemicals on fruits</li> <li>• Use of additives on fruits</li> <li>• Rules maximum levels of agro-chemical residues in fruits</li> <li>• Rules on marketing and labelling of fruits</li> <li>• Rules on materials intended to come into contact with fruits</li> <li>• Rules on certification of fruit producers</li> </ul>
<i>Planting materials</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Seeds</li> <li>• seedlings</li> <li>• splits</li> <li>• crowns</li> <li>• slips</li> <li>• Cuttings</li> <li>• Suckers</li> <li>• Tissue culture</li> </ul>
<i>Good Agricultural Practices (GAP)</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Field hygiene</li> <li>• Selection of clean planting materials</li> <li>• Safe use of agro-chemicals</li> <li>• Maximum Residual Levels of agro-chemicals used</li> <li>• Environmental sustainability</li> </ul>
<i>Fruit quality parameters</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Fruit Color</li> <li>• fruit skin texture</li> <li>• uniformity</li> <li>• presence or absence of damage from bruises or pests on pests</li> </ul>

## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

### Required skills

The individual needs to demonstrate the following skills:

- Tilling
- Measuring
- Leveling
- Gaping
- Pruning
- Spraying
- Pests , diseases and nutrients deficiency scouting
- Equipment calibration
- Technical Report writing
- Produce handling
- Soil sampling
- Observation
- Negotiation
- Digital literacy

## Required knowledge

The individual needs to demonstrate knowledge of:

- Sources of quality water
- Agro Ecological Zonation
- Sub-tropical fruit orchard establishment and management
- Types of sub-tropical fruits
- Physiology of sub-tropical fruit trees
- Types of tools and equipment used in production of sub-tropical fruits
- Soil sampling and testing
- Soil conservation
- Phyto-sanitary requirements
- Good Agricultural Practices
- Sources of quality planting materials for sub-tropical fruit trees
- Husbandry practices in sub-tropical fruit production
- Subtropical fruit production Technologies
- Flower induction
- Maturity indices in sub-tropical fruits
- Harvesting and Post Harvesting Handling of sub-tropical fruits
- Accounting principles
- Production records and reports
- Waste Management
- Occupational Safety and Health Procedures
- General management of sub-tropical fruit production farm

## EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Prepared planting land to a level suitable to the planting material 1.2 Sourced planting materials adequate for the prepared land 1.3 Observed safety measures by using Personal Protective Equipment (PPE ) and correct tools 1.4 Established fruits suitable for the Agro Ecological zone, market demand 1.5 Followed required process of producing fruits 1.6 Efficiently used the inputs 1.7 Harvested and carried out post-harvest handling of sub-tropical fruits
2. Resource Implications	The following resources must be provided during assessment : 2.1 Assessment location 2.2 Farm plan

	<p>2.3 Soil sampling guideline</p> <p>2.4 Procurement policy</p> <p>2.5 Good Agricultural Practices manual</p> <p>2.6 MoALF fruits Production manual</p> <p>2.7 Farm policy</p>
3. Methods of Assessment	<p>Competency may be assessed through:</p> <p>3.1 Observation</p> <p>3.2 Written tests</p> <p>3.3 Oral questioning</p> <p>3.4 Third party reports</p>
4. Context of Assessment	<p>Competency may be assessed:</p> <p>4.1 Off-the-job</p> <p>4.2 On-the-job</p> <p>4.3 Work placement -attachment</p> <p>Off the job assessment must be undertaken in a closely simulated workplace environment.</p>
5. Guidance information for assessment	<p>What can be assessed in holistic assessment (with other units relevant to the industry sector, workplace and job roles) is recommended. Attitude is assessed alongside production of sub-tropical fruits.</p>



## PRODUCE TEMPERATE FRUITS

**UNIT CODE:** HO/OS/HP/CR/03/6

### UNIT DESCRIPTION

This unit specifies the competencies required to produce temperate fruits. It includes preparing temperate fruits orchard, producing temperate fruits, harvesting temperate fruits, determining productivity and quality of fruits produced, carrying out post-harvest handling of the fruits and generating a production report.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
<p>These describe the key outcomes which make up workplace function.</p>	<p>These are assessable statements which specify the required level of performance for each of the elements. <i><b>Bold and italicized terms are elaborated in the range.</b></i></p>
<p>1. Prepare to produce temperate fruits</p>	<p>1.1 <i>Temperate fruits</i> to be established are determined in accordance with <i>Agro Ecological Zone (AEZ)</i>, farm plan and market demand                      1.2 <b>Orchard</b> site is selected based on fruit tree chosen and the farm plan                      1.3 <i>Tools, equipment, materials and supplies</i> are identified and sourced based on the type of fruit to be established                      1.4 Soil for analysis is sampled as per <i>soil sampling procedure</i>                      1.5 Soil erosion is controlled based on topography, soil type and level of degradation.                      1.6 Orchard/land is prepared according to <i>agronomic requirements</i> of the fruit                      1.7 Planting materials are sourced in accordance with procurement procedures, <i>phyto-sanitary requirements</i> and the size of the orchard to be established                      1.8 Planting holes for temperate fruit seedlings are prepared based on agronomic requirements, <i>Good Agricultural Practices (GAP)</i> and MoALF fruits production manual</p>
<p>2. Produce temperate fruits</p>	<p>2.1 Seedlings are planted based on agronomic requirements                      2.2 Planted temperate fruit seedlings are pruned as per agronomic requirements                      2.3 Orchard is protected from weeds, pests and diseases as per GAP                      2.4 Established temperate fruit trees are fed based on soil analysis report                      2.5 Established temperate fruit trees are watered, mulched and trained according to environmental conditions and growth habits                      2.6 Physiological disorders in the temperate fruit trees are managed as per the MoALF fruit production manual                      2.7 Temperate fruit trees are induced to flower as per GAP and fruit tree type                      2.8 Temperate fruits are harvested in accordance with the MoALF fruits production manual</p>
<p>3. Evaluate production of</p>	<p>3.1 Quality of temperate fruits is assessed based on <i>fruit quality parameters</i> and MoALF fruits production manual</p>

temperate fruits	3.2 Quantity of fruits produced is assessed based on MoALF production manual 3.3 Return on investment is determined as per accounting principles 3.4 Recommendations are made based on evaluation report.
4. Complete production of temperate fruits	4.1 Post harvest handling of the temperate fruits is carried out as per MoALF production manual 4.2 Temperate fruits production report is generated in accordance with the production procedures 4.3 Temperate fruits production report is shared according to farm policies 4.4 Waste management is undertaken in accordance with Environmental Management and Coordination Act (EMCA)

## RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

Variable	Range
<i>Temperate fruits</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Plums</li> <li>• Pears</li> <li>• Apples</li> <li>• Peaches</li> <li>• Apricot</li> </ul>
<i>Tools</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Hoes</li> <li>• Machetes</li> <li>• Secateurs</li> <li>• Shovels</li> <li>• Soil augur</li> <li>• Panga</li> <li>• Pegs</li> <li>• Hammer</li> <li>• Saw</li> <li>• Bucket</li> <li>• Secateurs</li> <li>• Shears</li> <li>• Dibbler</li> <li>• Pegs</li> </ul>
<i>Equipment</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Spray pumps</li> <li>• Watering cans</li> <li>• Hose pipes</li> <li>• Plough</li> <li>• Harrows</li> <li>• Ridges</li> <li>• Boom sprayer</li> <li>• Pruning saw</li> </ul>

	<ul style="list-style-type: none"> <li>• Wire strainer</li> <li>• Traps</li> <li>• Pipe sprinklers</li> <li>• Scouting flags</li> <li>• Storage tanks</li> <li>• Tractors</li> <li>• Grading shed</li> <li>• Bud count square</li> <li>• Meteorological equipment</li> </ul>
<p><b><i>Materials and supplies</i></b> includes but not limited to:</p>	<ul style="list-style-type: none"> <li>• Pesticides</li> <li>• Fertilizers</li> <li>• Stationery</li> <li>• Manures</li> <li>• Seedlings /planting materials</li> <li>• Khaki paper bags size 3</li> <li>• Rope</li> <li>• Nets</li> <li>• Translucent papers</li> <li>• Papers</li> <li>• Trellising wire and poles</li> <li>• Fencing wire</li> <li>• Staking sticks</li> <li>• Nails</li> <li>• Herbicides</li> <li>• Pesticides</li> <li>• Pheromones</li> </ul>
<p><b><i>Soil sampling procedure</i></b> includes but not limited to:</p>	<p>The process of</p> <ul style="list-style-type: none"> <li>• soil collection,</li> <li>• packaging and</li> <li>• submission for analysis</li> </ul>
<p><b><i>Agronomic requirements</i></b> include but not limited to:</p>	<ul style="list-style-type: none"> <li>• Growing cycle and growing period</li> <li>• Radiation</li> <li>• Temperature</li> <li>• Rooting</li> <li>• Aeration</li> <li>• Water quantity and quality</li> <li>• Nutrients</li> <li>• Salinity</li> <li>• Pests</li> <li>• Diseases</li> <li>• Weeds</li> <li>• Wind</li> </ul>
<p><b><i>Phyto-sanitary requirements</i></b> includes but not limited to:</p>	<ul style="list-style-type: none"> <li>• Rules on use of agro-chemicals on fruits</li> <li>• Use of additives on fruits</li> <li>• Rules maximum levels of agro-chemical residues in fruits</li> </ul>

	<ul style="list-style-type: none"> <li>• Rules on marketing and labelling of fruits</li> <li>• Rules on materials intended to come into contact with fruits</li> <li>• Rules on certification of fruit producers</li> </ul>
<i>Planting materials</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Seeds</li> <li>• Seedlings</li> <li>• Cuttings</li> </ul>
<i>Good Agricultural Practices (GAP)</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Field hygiene</li> <li>• Selection of clean planting materials</li> <li>• Safe use of agro-chemicals</li> <li>• Maximum Residual Levels of agro-chemicals used</li> <li>• Environmental sustainability</li> </ul>
<i>Fruit quality parameters</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Fruit Color</li> <li>• Fruit skin texture</li> <li>• Uniformity</li> <li>• Presence or absence of damage from bruises or pests on pests</li> </ul>

## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

### Required skills

The individual needs to demonstrate the following skills:

- Tilling
- Measuring
- Leveling
- Gaping
- Pruning
- Spraying
- Pests, diseases and nutrients deficiency scouting
- Equipment calibration
- Technical Report writing
- Produce handling
- Soil sampling
- Observation
- Negotiation
- Digital literacy

### Required knowledge

The individual needs to demonstrate knowledge of:

- Sources of quality water
- Agro Ecological Zonation
- Temperate fruit orchard establishment and management
- Types of temperate fruits
- Physiology of temperate fruits

- Types of tools and equipment used in production of temperate fruits
- Soil sampling and testing
- Soil conservation
- Phyto-sanitary requirements
- Good Agricultural Practices
- Sources of quality planting materials for temperate fruit trees
- Husbandry practices in temperate fruit production
- Temperate fruit production Technologies
- Flower induction
- Maturity indices in temperate fruits
- Harvesting and Post Harvesting Handling of temperate fruits
- Accounting principles
- Production records and reports
- Waste Management
- Occupational Safety and Health Procedures
- Harvesting and Post Harvesting Handling of temperate fruits
- General management of temperate fruit production farm

### EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Prepared planting land to a level suitable to the planting material 1.2 Sourced planting materials adequate for the prepared land 1.3 Observed safety measures by using Personal Protective Equipment (PPE ) and correct tools 1.4 Established fruits suitable for the Agro Ecological zone, market demand 1.5 Followed required process of producing fruits 1.6 Efficiently used the inputs 1.7 Harvested and carried out post-harvest handling of temperate fruits
2. Resource Implications (required for assessment )	The following resources must be provided during assessment: 2.1 Assessment location 2.2 Farm plan 2.3 Soil sampling guideline 2.4 Procurement policy 2.5 Good Agricultural Practices manual 2.6 MoALF fruits Production manual 2.7 Farm policy
3. Methods of Assessment	Competency may be assessed through: 3.1 Observation 3.2 Written tests

	<p>3.3 Oral questioning</p> <p>3.4 Third party reporting</p>
<p>4. Context of Assessment</p>	<p>Competency may be assessed:</p> <p>4.1 Off-the-job</p> <p>4.2 On-the-job</p> <p>4.3 Work placement -attachment</p> <p>Off the job assessment must be undertaken in a closely simulated workplace environment.</p>
<p>5. Guidance information for assessment</p>	<p>What can be assessed in holistic assessment (with other units relevant to the industry sector, workplace and job roles) is recommended. Attitude is assessed alongside production of temperate fruits.</p>

## PRODUCE VINE FRUITS

**UNIT CODE:** HO/OS/HP/CR/04/6

### UNIT DESCRIPTION

This unit specifies the competencies required to produce vine fruits. It includes preparing vine fruits orchard, producing vine fruits, harvesting vine fruits, determining productivity and quality of fruits produced, carrying out post-harvest handling of the fruits and generating production report.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b> These describe the key outcomes which make up workplace function.	<b>PERFORMANCE CRITERIA</b> These are assessable statements which specify the required level of performance for each of the elements. <i><b>Bold and italicized terms are elaborated in the range.</b></i>
1. Prepare to produce Vine Fruits	1.1 <i>Vine fruits</i> to be established are determined in accordance with <b>Agro Ecological Zone (AEZ)</b> , farm plan and market demand 1.2 Orchard site is selected based on fruit tree chosen and the farm plan 1.3 Tools, equipment, materials and supplies are identified and sourced based on the type of fruit to be established 1.4 Soil for analysis is sampled as per <b>soil sampling procedure</b> 1.5 Soil erosion is controlled based on topography, soil type and level of degradation. 1.6 Orchard / Land is prepared according to <b>agronomic requirements</b> of the fruit 1.7 Planting materials are sourced in accordance with procurement procedures, <b>phyto-sanitary requirements</b> and the size of the orchard to be established 1.8 Planting holes for vine fruit seedlings are prepared based on agronomic requirements, <b>Good Agricultural Practices (GAP)</b> and MoALF fruits production manual
2. Produce Vine Fruits	2.1 Seedlings are planted based on agronomic requirements 2.2 Planted vines are pruned as per agronomic requirements 2.3 Orchard is protected from weeds, pests and diseases as per GAP 2.4 Established vines are fed based on soil analysis report 2.5 Established vines are watered, mulched and staked and trained according to environmental conditions and growth habits 2.6 Physiological disorders in the vines are managed as per the MoALF fruit production manual 2.7 Vines are induced to flower as per GAP and fruit tree type 2.8 Vine fruits are harvested in accordance with the MoALF fruits production manual
3. Evaluate production of Vine Fruits	3.1 Quality of vine fruits is assessed based on <b>fruit quality parameters</b> and MoALF fruits production manual 3.2 Quantity of fruits produced is assessed based on MoALF production manual 3.3 Return on investment is determined as per accounting principles

	3.4 Recommendations are made based on evaluation report
4. Complete production of Vine Fruits	4.1 Post harvest handling of the vine fruits is carried out as per MoALF production manual 4.2 Vine fruits production report is generated in accordance with the production procedures 4.3 Vine fruits production report is shared according to farm policies 4.4 Waste management is undertaken in accordance with Environmental Management and Coordination Act (EMCA)

## RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

Variable	Range
<i>Vine fruits</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Grapes</li> <li>• Passion fruits</li> <li>• Dates</li> <li>• Kiwi</li> <li>• Water melons</li> </ul>
<i>Tools</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Hoes</li> <li>• Machetes</li> <li>• Secateurs</li> <li>• Shovels</li> <li>• Soil augur</li> <li>• Panga</li> <li>• Pegs</li> <li>• Hammer</li> <li>• Saw</li> <li>• Bucket</li> <li>• Secateurs</li> <li>• Shears</li> <li>• Dibbler</li> <li>• Pegs</li> </ul>
<i>Equipment</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Spray pumps</li> <li>• Watering cans</li> <li>• Hose pipes</li> <li>• Plough</li> <li>• Harrows</li> <li>• Ridges</li> <li>• Boom sprayer</li> <li>• Pruning saw</li> <li>• Wire strainer</li> <li>• Traps</li> <li>• Pipe sprinklers</li> <li>• Scouting flags</li> </ul>



	<ul style="list-style-type: none"> <li>• Storage tanks</li> <li>• Tractors</li> <li>• Grading shed</li> <li>• Bud count square</li> <li>• Meteorological equipment</li> </ul>
<p><b><i>Materials and supplies</i></b> includes but not limited to:</p>	<ul style="list-style-type: none"> <li>• Pesticides</li> <li>• Fertilizers</li> <li>• Stationery</li> <li>• Manures</li> <li>• Seedlings /planting materials</li> <li>• Khaki paper bags size 3</li> <li>• Rope</li> <li>• Nets</li> <li>• Translucent papers</li> <li>• Papers</li> <li>• Trellising wire and poles</li> <li>• Fencing wire</li> <li>• Staking sticks</li> <li>• Nails</li> <li>• Herbicides</li> <li>• Pesticides</li> <li>• Pheromones</li> </ul>
<p><b><i>Soil sampling procedure</i></b> includes but not limited to:</p>	<p>The process of</p> <ul style="list-style-type: none"> <li>• soil collection,</li> <li>• packaging and</li> <li>• submission for analysis</li> </ul>
<p><b><i>Agronomic requirements</i></b> include but not limited to:</p>	<ul style="list-style-type: none"> <li>• Growing cycle and growing period</li> <li>• Radiation</li> <li>• Temperature</li> <li>• Rooting</li> <li>• Aeration</li> <li>• Water quantity and quality</li> <li>• Nutrients</li> <li>• Salinity</li> <li>• Pests</li> <li>• Diseases</li> <li>• Weeds</li> <li>• Wind</li> </ul>
<p><b><i>Phyto-sanitary requirements</i></b> includes but not limited to:</p>	<ul style="list-style-type: none"> <li>• Rules on use of agro-chemicals on fruits</li> <li>• Use of additives on fruits</li> <li>• Rules maximum levels of agro-chemical residues in fruits</li> <li>• Rules on marketing and labelling of fruits</li> <li>• Rules on materials intended to come into contact with fruits</li> <li>• Rules on certification of fruit producers</li> </ul>

<i>Planting materials</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Seeds</li> <li>• seedlings</li> <li>• Cuttings</li> </ul>
<i>Good Agricultural Practices (GAP)</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Field hygiene</li> <li>• Selection of clean planting materials</li> <li>• Safe use of agro-chemicals</li> <li>• Maximum Residual Levels of agro-chemicals used</li> <li>• Environmental sustainability</li> </ul>
<i>Fruit quality parameters</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Fruit Color</li> <li>• fruit skin texture</li> <li>• uniformity</li> <li>• presence or absence of damage from bruises or pests on pests</li> </ul>

## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

### Required skills

The individual needs to demonstrate the following skills:

- Tilling
- Measuring
- Leveling
- Gaping
- Pruning
- Spraying
- Pests, diseases and nutrients deficiency scouting
- Equipment calibration
- Technical Report writing
- Produce handling
- Soil sampling
- Observation
- Negotiation
- Digital literacy

### Required knowledge

The individual needs to demonstrate knowledge of:

- Sources of quality water
- Agro Ecological Zonation
- Vine fruit orchard establishment and management
- Types of vine fruits
- Physiology of vines
- Types of tools and equipment used in production of vine fruits
- Soil sampling and testing
- Soil conservation
- Phyto-sanitary requirements

- Good Agricultural Practices
- Sources of quality planting materials for vine fruit trees
- Husbandry practices in vine fruit production
- Vine fruit production Technologies
- Flower induction
- Maturity indices in vine fruits
- Harvesting and Post Harvesting Handling of vine fruits
- Accounting principles
- Production records and reports
- Waste Management
- Occupational Safety and Health Procedures
- General management of vine fruit production farm

### EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Prepared planting land to a level suitable to the planting material 1.2 Sourced planting materials adequate for the prepared land 1.3 Observed safety measures by using Personal Protective Equipment (PPE ) and correct tools 1.4 Established fruits suitable for the Agro Ecological zone, market demand 1.5 Followed required process of producing fruits 1.6 Efficiently used the inputs 1.7 Harvested and carried out post-harvest handling of vine fruits
2. Resource Implications	The following resources must be provided during assessment : 2.1 Assessment location 2.2 Farm plan 2.3 Soil sampling guideline 2.4 Procurement policy 2.5 Good Agricultural Practices manual 2.6 MoALF fruits Production manual 2.7 Farm policy
3. Methods of Assessment	Competency may be assessed through: 3.1 Observation 3.2 Written tests 3.3 Oral questioning 3.4 Third party reporting
4. Context of Assessment	Competency may be assessed: 4.1 Off-the-job 4.2 On-the-job 4.3 Work placement -attachment

	Off the job assessment must be undertaken in a closely simulated workplace environment.
5. 5. Guidance information for assessment	What can be assessed in holistic assessment (with other units relevant to the industry sector, workplace and job roles) is recommended. Attitude is assessed alongside production of vine fruits.

## PRODUCE MUSHROOMS

**UNIT CODE:** HO/OS/HP/CR/05/6

### UNIT DESCRIPTION

This unit specifies the competencies required to produce mushrooms. It includes preparing mushroom production structures and substrates, spawning, managing and harvesting the mushrooms, determining productivity and quality of mushrooms produced, generating production report and carrying out post-harvest handling of mushrooms.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
These describe the key outcomes which make up workplace function.	These are assessable statements which specify the required level of performance for each of the elements. <b><i>Bold and italicized terms are elaborated in the range.</i></b>
1. Prepare to produce mushroom	1.1 The type of <b><i>Mushroom</i></b> to be established is determined in accordance with <b><i>market demand</i></b> 1.2 The <b><i>mushroom house</i></b> is sited according to farm plans 1.3 <b><i>Tools, equipment, materials and supplies</i></b> are identified and sourced based on the requirements of the job 1.4 The mushroom house is constructed depending on MoALF production guidelines 1.5 <b><i>Starter culture</i></b> for mushroom is prepared according to <b><i>culturing procedures</i></b> 1.6 Starter culture for mushroom is treated according to <b><i>treatment</i></b> guidelines 1.7 The <b><i>substrate</i></b> is prepared and placed in production structures according to production guidelines 1.8 The <b><i>spawns</i></b> are sourced and cultured according to production guidelines
2. Produce mushroom	2.1 The starter culture is put in place based on MoALF production guidelines 2.2 Mushroom are spawned on the substrate as per production guidelines 2.3 Established mushrooms are managed as per MoALF production guidelines 2.4 Established mushroom are protected from pests and diseases as per MoALF production guidelines 2.5 Established mushroom are harvested as per production guidelines
3. Evaluate the production of mushroom	3.1 Quality of mushrooms is assessed based on <b><i>mushroom quality parameters</i></b> as per production manual 3.2 Quantity of mushroom produced is assessed based on production practices 3.3 Return on investment is determined as per accounting principles
4. Complete production of	4.1 Post-harvest handling of the mushrooms is carried out as per MoALF production manual

mushrooms	<p>4.2 Mushroom production report is generated in accordance with the production procedures</p> <p>4.3 Mushroom production report is shared according to farm policies</p> <p>4.4 Waste management is undertaken in accordance with Environmental Management and Coordination Act (EMCA)</p>
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## RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

Variable	Range
<i>Mushroom</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Oyster,</li> <li>• shiitake and</li> <li>• white button</li> </ul>
<i>Tools</i> include but not limited to:	<ul style="list-style-type: none"> <li>• Weighing scale</li> </ul>
<i>Materials</i> include but not limited to:	<ul style="list-style-type: none"> <li>• Poly tubes</li> <li>• Lockable drum</li> <li>• Table spoon</li> <li>• Sisal twines</li> <li>• Supplement –soya bean meal</li> <li>• Plant residues –stalks and bran</li> <li>• Polythene bags</li> <li>• Shelves</li> <li>• Shade</li> <li>• Spawn</li> <li>• Water</li> <li>• Substrate</li> </ul>
<i>Equipment</i> include but not limited to:	<ul style="list-style-type: none"> <li>• PPE –hand gloves, dust coat, dust masks</li> <li>• Hand spray equipment</li> <li>• Oven</li> <li>• Basin</li> </ul>
<i>Materials and supplies</i> include but are not limited to:	<ul style="list-style-type: none"> <li>• Methylated spirit</li> <li>• Lime</li> <li>• Fuel for heating substrate</li> <li>• Molasses</li> <li>• Sisal twine</li> <li>• Soap</li> </ul>
<i>Mushroom production structures</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Mushroom House</li> <li>• Shelves</li> <li>• Plastic Bags</li> <li>• Heat Oven</li> </ul>

<i>Treatment</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• heating</li> <li>• steaming</li> <li>• use of chemicals</li> </ul>
<i>Culturing procedures</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• tissue culture techniques</li> <li>• multi spore print method</li> <li>• single/mono spore print method</li> </ul>
<i>Spawns</i> include but not limited to:	<ul style="list-style-type: none"> <li>• Spores</li> <li>• mycelia</li> </ul>
<i>Substrate</i> includes but not limited to:	Compost on which to grow mushroom like sugarcane bagasse, leaves, banana fiber and leaves and cotton waste
<i>Spawning</i> includes but not limited to:	Seeding the substrate with mushroom inoculums
<i>Starter culture</i> includes but not limited to:	<p>Nutrients used by mycelium growth and include that are</p> <ul style="list-style-type: none"> <li>• organic soils,</li> <li>• plant growth regulators,</li> <li>• vitamins,</li> <li>• amino acids and</li> <li>• complex organic supplements ,</li> <li>• carbohydrates ,</li> <li>• water media matrix, and</li> <li>• appropriate PH 7.2-7.5</li> </ul>
<i>Quality parameters</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• uniformity,</li> <li>• presence or absence of damage from bruises from pests or mishandling</li> </ul>

## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

### Required skills

The individual needs to demonstrate the following skills:

- Tilling
- Measuring
- Leveling
- Gaping
- Pruning
- Spraying
- Pests, diseases and nutrients deficiency scouting
- Equipment calibration
- Technical Report writing
- Produce handling
- Soil sampling
- Observation
- Negotiation
- Digital literacy

## Required knowledge

The individual needs to demonstrate knowledge of:

- Agro Ecological Zonation
- Mushroom production structure Management
- Types of mushrooms
- Physiology of mushrooms
- Types of tools and equipment used in production of mushrooms
- Sourcing/Procurement Procedures (I.E. Seedlings, Supplies)
- Accounting principles
- Mushrooms production Terminologies
- Mushroom production Technologies
- Occupational Safety and Health Procedures
- Controlling Pests and Diseases in mushrooms
- Soil Testing
- Regulations and Standards of establishing mushroom production structures
- Waste Management
- Determining mushroom maturity
- Harvesting and Post Harvesting Handling of mushrooms
- General management of mushroom production farm

## EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Prepared planting land to a level suitable to the planting material 1.2 Sourced planting materials adequate for the prepared land 1.3 Observed safety measures by using Personal Protective Equipment (PPE ) and correct tools 1.4 Established mushrooms suitable for the Agro Ecological zone, market demand 1.5 Applied safety measures by using Personal Protective Equipment 1.6 Followed required process of producing mushrooms 1.7 Efficiently used the inputs 1.8 Harvested mushrooms and carried out post-harvest handling of mushrooms
2. Resource Implications	The following resources must be provided during assessment: 2.1 Assessment location 2.2 Farm plan 2.3 Soil sampling procedure 2.4 Procurement policy and procedure 2.5 Good Agricultural Practices manual



	<p>2.6 MoALF mushroom production manual</p> <p>2.7 Accounting principles</p> <p>2.8 Farm policy</p>
3. Methods of Assessment	<p>Competency may be accessed through:</p> <p>3.1 Observation</p> <p>3.2 Written tests</p> <p>3.3 Oral questioning</p> <p>3.4 Third party reports</p>
4. Context of Assessment	<p>Competency may be assessed:</p> <p>4.1 Off-the-job</p> <p>4.2 On-the-job</p> <p>4.3 Work placement -attachment</p> <p>Off the job assessment must be undertaken in a closely simulated workplace environment.</p>
5. Guidance information for assessment	<p>What can be assessed in holistic assessment (with other units relevant to the industry sector, workplace and job roles) is recommended. Attitude is assessed alongside production of mushrooms.</p>

## PRODUCE HERBS AND SPICES

**UNIT CODE:** HO/OS/HP/CR/06/6

### UNIT DESCRIPTION

This unit specifies the competencies required to produce quality and clean herbs and spices. It includes preparing herbs and spices seedbed, producing herbs and spices while observing regulatory requirements and keeping accurate production records, determining productivity and quality of herbs and spices produced, carrying out post-harvest handling of the vine fruits and generating mushroom production report.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
<p>These describe the key outcomes which make up workplace function.</p>	<p>These are assessable statements which specify the required level of performance for each of the elements. <i><b>Bold and italicized terms are elaborated in the range.</b></i></p>
<p>1. Prepare to produce herbs and spices</p>	<p>1.1 <i><b>Herbs and spices</b></i> to be established are determined in accordance with <i><b>Agro Ecological Zone (AEZ)</b></i>, farm plan and market demand                      1.2 Herbs and spices seedbed site is selected based on herbs and spices chosen and the farm plan                      1.3 Tools, equipment, materials and supplies are identified and sourced based on the type of herbs and spices to be established                      1.4 Soil for analysis is sampled as per <i><b>soil sampling procedure</b></i>                      1.5 Soil erosion is controlled based on topography, soil type and level of degradation.                      1.6 Seedbed is prepared according to <i><b>agronomic requirements</b></i> of the herbs and spices                      1.7 Planting materials are sourced in accordance with procurement procedures, <i><b>phyto-sanitary requirements</b></i> and the size of the seedbed to be established                      1.8 Planting holes for herbs and spices seedlings are prepared based on agronomic requirements, <i><b>Good Agricultural Practices (GAP)</b></i> and MoALF herbs and spices production manual</p>
<p>2. Produce herbs and spices</p>	<p>2.1 Seedlings are planted based on agronomic requirements                      2.2 Seed bed of herbs and spices is watered, thinned, gapped, mulched and weeded per environmental conditions and growth habits, GAP and MoALF herbs and spices production manual                      2.3 Planted herbs and spices are pruned as per agronomic requirements                      2.4 Herbs and spices are pruned and protected from pests and diseases as per agronomic requirements, GAP and MoALF herbs and spices production manual                      2.5 Established herbs and spices are fed based on soil analysis report                      2.6 Physiological disorders in the herbs and spices are managed as per the MoALF herbs and spices production manual                      2.7 2.6 Herbs and spices are harvested in accordance with the MoALF herbs and spices production manual</p>

3. Evaluate production of herbs and spices	<p>3.1 Quality of herbs and spices is assessed based on herbs and spices <b>quality parameters</b> and MoALF herbs and spices production manual</p> <p>3.2 Quantity of herbs and spices produced is assessed based on MoALF herbs and spices production manual</p> <p>3.3 Return on investment is determined as per accounting principles</p> <p>3.4 Recommendations are made based on evaluation report</p>
4. Complete production of herbs and spices	<p>4.1 Post-harvest handling of the herbs and spices is carried out as per MoALF herbs and spices production manual</p> <p>4.2 Herbs and spices production report is generated in accordance with the production procedures</p> <p>4.3 Herbs and spices production report is shared according to farm policies</p> <p>4.4 Waste management is undertaken in accordance with Environmental Management and Coordination Act (EMCA)</p>

### RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

Variable	Range
<b>Herbs and spices</b> include but not limited to:	<ul style="list-style-type: none"> <li>• Coriander</li> <li>• Parsley</li> <li>• Garlic</li> <li>• Ginger</li> <li>• Dill</li> <li>• Chives</li> <li>• Mint</li> <li>• Rosemary</li> <li>• Thyme</li> </ul>
<b>Planting materials</b> include but not limited to:	<ul style="list-style-type: none"> <li>• Seeds</li> <li>• Cuttings</li> <li>• Seedlings</li> <li>• Bulbs</li> <li>• Tubers</li> </ul>
<b>Tools</b> includes but not limited to:	<ul style="list-style-type: none"> <li>• Hoes</li> <li>• Machetes</li> <li>• Secateurs</li> <li>• Shovels</li> <li>• Soil augur</li> <li>• Panga</li> <li>• Pegs</li> <li>• Hammer</li> <li>• Saw</li> <li>• Bucket</li> </ul>

	<ul style="list-style-type: none"> <li>• Secateurs</li> <li>• Shears</li> <li>• Dibbler</li> <li>• Pegs</li> </ul>
<b>Equipment</b> includes but not limited to:	<ul style="list-style-type: none"> <li>• Spray pumps</li> <li>• Watering cans</li> <li>• Hose pipes</li> <li>• Plough</li> <li>• Harrows</li> <li>• Ridges</li> <li>• Boom sprayer</li> <li>• Pruning saw</li> <li>• Traps</li> <li>• Pipe sprinklers</li> <li>• Scouting flags</li> <li>• Storage tanks</li> <li>• Tractors</li> </ul>
<b>Materials and supplies</b> includes but not limited to:	<ul style="list-style-type: none"> <li>• Pesticides</li> <li>• Fertilizers</li> <li>• Stationery</li> <li>• Manures</li> <li>• Seedlings /planting materials</li> <li>• Khaki paper bags size 3</li> <li>• Rope</li> <li>• Nets</li> <li>• Translucent papers</li> <li>• Papers</li> <li>• Fencing wire</li> <li>• Nails</li> <li>• Herbicides</li> <li>• Pesticides</li> </ul>
<b>Agronomic requirements</b> include but not limited to:	<ul style="list-style-type: none"> <li>• Growing cycle and growing period</li> <li>• Radiation</li> <li>• Temperature</li> <li>• Rooting</li> <li>• Aeration</li> <li>• Water quantity and quality</li> <li>• Nutrients</li> <li>• Salinity</li> <li>• Pests</li> <li>• Diseases</li> <li>• Weeds</li> <li>• Wind</li> </ul>
<b>Phyto-sanitary requirements</b> includes but not limited to:	<ul style="list-style-type: none"> <li>• Rules on use of agro-chemicals on herbs and spices</li> <li>• Use of additives on herbs and spices</li> <li>• Rules maximum levels of agro-chemical residues in herbs and</li> </ul>

	spices <ul style="list-style-type: none"> <li>• Rules on marketing and labelling of herbs and spices</li> <li>• Rules on materials intended to come into contact with herbs and spices</li> <li>• Rules on certification of producers of herbs and spices</li> </ul>
<i>Good Agricultural Practices (GAP)</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Field hygiene</li> <li>• Selection of clean planting materials</li> <li>• Safe use of agro-chemicals</li> <li>• Maximum Residual Levels of agro-chemicals used</li> <li>• Environmental sustainability</li> </ul>
<i>Herbs and spices quality parameters</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Color</li> <li>• Size</li> <li>• smell</li> <li>• uniformity</li> <li>• presence or absence of damage from bruises or pests on pests</li> </ul>

## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

### Required skills

The individual needs to demonstrate the following skills:

- Tilling
- Measuring
- Leveling
- Gaping
- Pruning
- Spraying
- Pests, diseases and nutrients deficiency scouting
- Equipment calibration
- Technical Report writing
- Produce handling
- Soil sampling
- Observation
- Negotiation
- Digital literacy

### Required knowledge

The individual needs to demonstrate knowledge of:

- Sources of quality water
- Agro Ecological Zonation
- Establishment and management of herbs and spices farm
- Types of herbs and spices
- Physiology of herbs and spices
- Types of tools and equipment used in production of herbs and spices
- Soil sampling and testing

- Soil conservation
- Phyto-sanitary requirements
- Good Agricultural Practices
- Sources of quality planting materials for herbs and spices
- Husbandry practices in production of herbs and spices
- Herbs and spices production Technologies
- Flower induction
- Maturity indices in herbs and spices
- Harvesting and Post Harvesting Handling of herbs and spices
- Accounting principles
- Production records and reports
- Waste Management
- Occupational Safety and Health Procedures
- General Management of herbs and spices farm

### EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Prepared planting land to a level suitable to the planting material 1.2 Sourced planting materials adequate for the prepared land 1.3 Observed safety measures by using Personal Protective Equipment (PPE ) and correct tools 1.4 Established herbs and spices suitable for the Agro Ecological zone, market demand 1.5 Followed required process of producing herbs and spices 1.6 Efficiently used the inputs 1.7 Harvested herbs and spices and carried out post-harvest handling of herbs and spices 1.8 Prepared accounting documents 1.9 Prepared production report
2. Resource Implications	The following resources must be provided: 2.1 Assessment location 2.2 Farm plan 2.3 Soil sampling guidelines 2.4 Procurement policy 2.5 Good Agricultural Practices manual 2.6 MoALF herbs and spices production manual 2.7 Farm policy
3. Methods of Assessment	Competency may be assessed through: 3.1 Observation 3.2 Written tests 3.3 Third party reporting 3.4 Oral questioning
4. Context of	Competency may be assessed:

Assessment	<p>4.1 Off-the-job 4.2 On-the-job 4.3 Work placement -attachment</p> <p>Off the job assessment must be undertaken in a closely simulated workplace environment.</p>
5. Guidance information for assessment	<p>What can be assessed in holistic assessment (with other units relevant to the industry sector, workplace and job roles) is recommended. Attitude is assessed alongside production of herbs and spices</p>

## PRODUCE HORTICULTURAL NUTS

**UNIT CODE:** HO/OS/HP/CR/07/6

### UNIT DESCRIPTION

This unit specifies the competencies required to produce quality and clean nuts by making adequate preparation before establishing, planting, carrying out husbandry practices and harvesting the nuts while observing regulatory requirements, keeping production record, carrying out post-harvest handling of nuts and generating a production report.

### ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
These describe the key outcomes which make up workplace function.	These are assessable statements which specify the required level of performance for each of the elements. <i><b>Bold and italicized terms are elaborated in the range.</b></i>
1. Prepare to produce nuts	1.1 <b>Nuts</b> to be established are determined in accordance with <b>Agro Ecological Zone</b> , farm plan and market demand 1.2 Site for production of the nuts is selected as per the farm plan 1.3 <b>Tools ,equipment, materials and supplies</b> are identified and sourced based on the requirements of the job 1.4 Soil for analysis is sampled as per <i>sampling procedure</i> 1.5 Soil erosion is controlled based on topography, soil type and level of degradation Planting land is prepared in accordance with the planting material 1.6 Holes for planting nuts are prepared in accordance with <i>Good Agricultural Practices (GAP) manual</i> and Nuts production manual 1.7 Planting materials are sourced in accordance with procurement procedure and laid down policies 1.8 Quantities of <i>planting material</i> is determined based on the acreage to be planted
2. Produce Nuts	2.1 Nuts are planted as per Good Agricultural Practices (GAP) manual and MoALF nuts production manual 2.2 Nut farm is watered, mulched, gapped and weeded and protected from pests and diseases as per the nuts MoALF production manual 2.3 Nuts are fed based on soil analysis report 2.4 Physiological disorders in the nut trees are managed as per the MoALF nuts production manual 2.5 Nuts are pruned as per the MoALF nuts production manual 2.6 2.6 Nuts are harvested in accordance with the MoALF nuts production manual
3. Evaluate nuts produced	3.1 <i>Quality</i> of nuts produced is evaluated based on nuts quality parameters 3.2 <i>Quantity</i> of nuts produced is evaluated based on nuts production manual 3.3 <i>Return on investment</i> is determined as per accounting principles 3.4 Recommendations are made based on evaluation report



4. Complete production of nuts	4.1 Post harvesting handling of nuts is carried out as per MoALF nuts production manual 4.2 Nuts production report is generated in accordance with MoALF nuts production manual 4.3 Nuts production reports are shared in accordance with farm policy 4.4 Waste management is undertaken in accordance with Environmental Management and Coordination Act (EMCA)
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### RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

<b>Variable</b>	<b>Range</b>
<i>Nuts</i> include but not limited to:	<ul style="list-style-type: none"> <li>• Macadamia</li> <li>• Ground nuts</li> <li>• Cashew nuts</li> <li>• Coconuts</li> </ul>
<i>Tools</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Hoes</li> <li>• Machetes</li> <li>• Secateurs</li> <li>• Shovels</li> <li>• Soil augur</li> <li>• Panga</li> <li>• Pegs</li> <li>• Hammer</li> <li>• Saw</li> <li>• Bucket</li> <li>• Secateurs</li> <li>• Shears</li> <li>• Dibbler</li> <li>• Pegs</li> </ul>
<i>Equipment</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Spray pumps</li> <li>• Watering cans</li> <li>• Hose pipes</li> <li>• Plough</li> <li>• Harrows</li> <li>• Ridges</li> <li>• Boom sprayer</li> <li>• Pruning saw</li> <li>• Wire strainer</li> <li>• Traps</li> <li>• Pipe sprinklers</li> <li>• Scouting flags</li> <li>• Storage tanks</li> <li>• Tractors</li> </ul>

	<ul style="list-style-type: none"> <li>• Grading shed</li> </ul>
<b>Materials and supplies</b> includes but not limited to:	<ul style="list-style-type: none"> <li>• Pesticides</li> <li>• Fertilizers</li> <li>• Stationery</li> <li>• Manures</li> <li>• Seedlings /planting materials</li> <li>• Khaki paper bags size 3</li> <li>• Rope</li> <li>• Papers</li> <li>• Fencing wire</li> <li>• Nails</li> <li>• Herbicides</li> <li>• Pesticides</li> </ul>
<b>Soil sampling procedure</b> includes but not limited to:	<p>The process of</p> <ul style="list-style-type: none"> <li>• soil collection</li> <li>• packaging</li> <li>• submission for analysis</li> </ul>
<b>Agronomic requirements</b> includes but not limited to:	<ul style="list-style-type: none"> <li>• Growing cycle and growing period</li> <li>• Radiation</li> <li>• Temperature</li> <li>• Rooting</li> <li>• Aeration</li> <li>• Water quantity and quality</li> <li>• Nutrients</li> <li>• Salinity</li> <li>• Pests</li> <li>• Diseases</li> <li>• Weeds</li> <li>• Wind</li> </ul>
<b>Planting materials</b> includes but not limited to:	<ul style="list-style-type: none"> <li>• Seeds</li> <li>• Seedlings,</li> <li>• cuttings</li> </ul>
<b>Phyto-sanitary requirements</b> includes but not limited to:	<ul style="list-style-type: none"> <li>• Rules on use of agro-chemicals on fruits</li> <li>• Use of additives on fruits</li> <li>• Rules maximum levels of agro-chemical residues in fruits</li> <li>• Rules on marketing and labelling of fruits</li> <li>• Rules on materials intended to come into contact with fruits</li> <li>• Rules on certification of fruit producers</li> </ul>
<b>Good Agricultural Practices (GAP)</b> includes but not limited to:	<ul style="list-style-type: none"> <li>• Field hygiene</li> <li>• Selection of clean planting materials</li> <li>• Safe use of agro-chemicals</li> <li>• Maximum Residual Levels of agro-chemicals used</li> <li>• Environmental sustainability</li> </ul>
<b>Nut quality parameters</b> includes but not limited to:	<ul style="list-style-type: none"> <li>• Nut Color</li> <li>• Nut skin texture</li> <li>• uniformity</li> </ul>

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|  | <ul style="list-style-type: none"><li>• presence or absence of damage from bruises or pests on pests</li></ul> |
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## **REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

### **Required skills**

The individual needs to demonstrate the following skills:

- Tilling
- Measuring
- Leveling
- Gaping
- Pruning
- Spraying
- Pests, diseases and nutrients deficiency scouting
- Equipment calibration
- Technical Report writing
- Produce handling
- Soil sampling
- Observation
- Negotiation
- Digital literacy

### **Required knowledge**

The individual needs to demonstrate knowledge of:

- Sources of quality water
- Agro Ecological Zonation
- Establishment and management of nut farm
- Types of nuts
- Physiology of nut trees
- Types of tools and equipment used in production of nuts
- Soil sampling and testing
- Soil conservation
- Phyto-sanitary requirements
- Good Agricultural Practices
- Sources of quality planting materials for nuts
- Husbandry practices in nuts production
- Nut production Technologies
- Maturity indices in nuts
- Harvesting and post harvesting handling of nuts
- Accounting principles

- Production records and reports
- Waste Management
- Occupational Safety and Health Procedures
- General Management of nut farm

## EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Prepared planting land to a level suitable to the planting material 1.2 Sourced planting materials adequate for the prepared land 1.3 Established nuts suitable for the Agro Ecological zone, market demand 1.4 Observed safety measures by using Personal Protective Equipment 1.5 Followed required process of producing nuts 1.6 Efficiently used the inputs 1.7 Harvested and carried out post-harvest handling of nuts 1.8 Prepared production report
2. Resource Implications	The following resources must be provided: 2.1 Assessment location 2.2 Farm plan 2.3 Soil sampling guideline 2.4 Procurement procedure 2.5 Good Agricultural Practices guidelines 2.6 MoALF Nuts production manual 2.7 Farm policy
3. Methods of Assessment	Competency may be assessed through: 3.1 Observation 3.2 Written tests 3.3 Third party reporting 3.4 Oral questioning
4. Context of Assessment	Competency may be assessed: 4.1 Off-the-job 4.2 On-the-job 4.3 Work placement -attachment  Off the job assessment must be undertaken in a closely simulated workplace environment.
5. Guidance information for assessment	What can be assessed in holistic assessment (with other units relevant to the industry sector, workplace and job roles) is recommended. Attitude is assessed alongside production of nuts.

## PRODUCE ORNAMENTAL PLANTS

**UNIT CODE:** HO/OS/HP/CR/08/6

### UNIT DESCRIPTION

This unit specifies the competencies required to produce quality and clean ornamental plants. It involves preparing the growing structures for ornamental plants, planting, carrying out husbandry practices on the ornamental plants while observing regulatory requirements and keeping production records, acclimatizing the ornamental plants and generating a production report.

### ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
<p>These describe the key outcomes which make up workplace function.</p>	<p>These are assessable statements which specify the required level of performance for each of the elements. <b><i>Bold and italicized terms are elaborated in the range.</i></b></p>
<p>1. Prepare to produce ornamental plants</p>	<p>1.1 <b><i>Ornamental plants</i></b> to be established are determined in accordance with <b><i>Agro Ecological Zone</i></b>, farm plan and market demand</p> <p>2.1 Site for production of the ornamental plants is selected as per the farm plan</p> <p>3.1 <b><i>Tools, equipment, materials and supplies</i></b> are identified and sourced based on the requirements of the job</p> <p>4.1 Soil for analysis is sampled as per <b><i>sampling procedure</i></b></p> <p>5.1 Soil erosion is controlled based on topography, soil type and level of degradation</p> <p>6.1 <b><i>Propagation structure</i></b> is prepared in accordance with the ornamental plants production manual</p> <p>7.1 Soil based planting medium is prepared in accordance with Good Agricultural Practices (GAP) manual and ornamental plants production manual</p> <p>8.1 Soilless planting medium is prepared in accordance with Good Agricultural Practices (GAP) manual and ornamental plants production manual</p> <p>9.1 <b><i>Planting materials</i></b> for the ornamental plants are sourced in accordance with <b><i>phyto-sanitary requirements</i></b>, procurement procedure and acreage to be planted</p>
<p>2. Produce ornamental plants</p>	<p>2.1 Seedlings/seeds are planted/potted as per <b><i>potting containers</i></b> and ornamental plants production manual.</p> <p>2.2 Ornamental plants are watered, weeded, pruned, supported/trained as per the ornamental plants production manual.</p> <p>2.3 Established ornamental plants are fed based on soil analysis report.</p> <p>2.4 Established ornamental plants are protected from pests and diseases as per GAP</p> <p>2.5 Physiological disorders in the ornamental plants are managed as per the ornamental plants production manual</p> <p>2.6 Ornamental plants are acclimatized as per ornamental plants production manual</p>

3. Evaluate ornamental plants produced	3.1 Quality of ornamental plants produced is evaluated based on ornamental plants production manual 3.2 Quantity of ornamental plants produced is evaluated based on ornamental plants production manual 3.3 Return on investment is determined as per accounting principles 3.4 Recommendations are made based on evaluation report
4. Complete production of ornamental plants	4.1 Ornamental plants production is documented in accordance with ornamental plants production manual 4.2 Ornamental plants production reports are shared in accordance with farm policy

## RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

Variable	Range
<b>Ornamental plants</b> include but not limited to:	<ul style="list-style-type: none"> <li>• Asters</li> <li>• Chrysanthemum</li> <li>• Bougainvillea</li> <li>• Statice</li> <li>• Marigold</li> <li>• Geranium</li> <li>• Larkspur</li> <li>• Petunia</li> </ul>
<b>Planting materials</b> include but not limited to:	<ul style="list-style-type: none"> <li>• Seeds</li> <li>• Seedlings</li> <li>• Cuttings</li> <li>• Tubers</li> <li>• Splits</li> <li>• Tissue culture</li> </ul>
<b>Propagation structures</b> include but not limited to:	<ul style="list-style-type: none"> <li>• Lath House</li> <li>• Net House</li> </ul>
<b>Potting containers</b>	<ul style="list-style-type: none"> <li>• Pots</li> <li>• Boxes</li> <li>• Planters</li> <li>• Trays</li> </ul>
<b>Tools</b> includes but not limited to:	<ul style="list-style-type: none"> <li>• Hoes</li> <li>• Machetes</li> <li>• Shovels</li> <li>• Soil augur</li> <li>• Panga</li> <li>• Pegs</li> <li>• Hammer</li> </ul>

	<ul style="list-style-type: none"> <li>• Saw</li> <li>• Bucket</li> <li>• Secateurs</li> <li>• Shears</li> <li>• Pegs</li> </ul>
<b>Equipment</b> includes but not limited to:	<ul style="list-style-type: none"> <li>• Spray pumps</li> <li>• Watering cans</li> <li>• Hose pipes</li> <li>• Plough</li> <li>• Harrows</li> <li>• Pruning saw</li> <li>• Wire strainer</li> <li>• Traps</li> <li>• Pipe sprinklers</li> <li>• Scouting flags</li> <li>• Storage tanks</li> <li>• Tractors</li> </ul>
<b>Materials and Supplies</b> includes but not limited to:	<ul style="list-style-type: none"> <li>• Pesticides</li> <li>• Fertilizers</li> <li>• Stationery</li> <li>• Manures</li> <li>• Seedlings /planting materials</li> <li>• Khaki paper bags size 3</li> <li>• Rope</li> <li>• Nets</li> <li>• Translucent papers</li> <li>• Papers</li> <li>• Fencing wire</li> <li>• Nails</li> <li>• Herbicides</li> <li>• Pesticides</li> </ul>
<b>Soil sampling procedure</b> includes but not limited to:	<p>The process of</p> <ul style="list-style-type: none"> <li>• soil collection,</li> <li>• packaging and</li> <li>• submission for analysis</li> </ul>
<b>Soilless growing medium</b> includes but not limited to	<ul style="list-style-type: none"> <li>• peat moss</li> <li>• perlite</li> <li>• vermiculite</li> <li>• sand</li> </ul>
<b>Agronomic requirements</b> include but not limited to:	<ul style="list-style-type: none"> <li>• Growing cycle and growing period</li> <li>• Radiation</li> <li>• Temperature</li> <li>• Rooting</li> <li>• Aeration</li> <li>• Water quantity and quality</li> <li>• Nutrients</li> </ul>

	<ul style="list-style-type: none"> <li>• Salinity</li> <li>• Pests</li> <li>• Diseases</li> <li>• Weeds</li> <li>• Wind</li> </ul>
<i>Phyto-sanitary requirements</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Rules on use of agro-chemicals on plants</li> <li>• Rules maximum levels of agro-chemical residues in plants</li> <li>• Rules on materials intended to come into contact with plants</li> <li>• Rules on certification of ornamental producers</li> </ul>
<i>Good Agricultural Practices(GAP)</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Field hygiene</li> <li>• Selection of clean planting materials</li> <li>• Safe use of agro-chemicals</li> <li>• Maximum Residual Levels of agro-chemicals used</li> <li>• Environmental sustainability</li> </ul>

## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

### Required skills

The individual needs to demonstrate the following skills:

- Tilling
- Measuring
- Leveling
- Gaping
- Pruning
- Spraying
- Pests , diseases and nutrients deficiency scouting
- Equipment calibration
- Technical Report writing
- handling of ornamental plants
- Soil sampling
- Observation
- Negotiation
- Digital literacy

### Required knowledge

The individual needs to demonstrate knowledge of:

- Sources of quality water
- Agro Ecological Zonation
- Establishment and management of ornamental plants
- Landscaping
- Types of ornamental plants
- Physiology of ornamental plants
- Types of tools and equipment used in production of ornamental plants
- Soil sampling and testing



- Soil conservation
- Phyto-sanitary requirements
- Good Agricultural Practices
- Sources of quality planting materials for ornamental plants
- Soilless growing medium
- Husbandry practices in ornamental plants
- Ornamental plants production Technologies
- Accounting principles
- Production records and reports
- Waste Management
- Occupational Safety and Health Procedures
- Acclimatization Of Ornamental Plants
- General management of ornamental plants production farm

### EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

<p>1. Critical Aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Prepared planting/potting structure/containers to a level suitable to the planting material</li> <li>1.2 Sourced planting materials adequate for the prepared structure/container</li> <li>1.3 Prepared planting medium as per the HCDA phytosanitary requirements</li> <li>1.4 Established ornamental plants suitable for the market demand</li> <li>1.5 Applied safety measures by using Personal Protective Equipment</li> <li>1.6 Followed required process of producing ornamental plants</li> <li>1.7 Efficiently used the inputs</li> <li>1.8 Acclimatized the ornamental plants</li> <li>1.9 Prepared accounting documents</li> <li>1.10 Prepared production report</li> </ul>
<p>2. Resource Implications</p>	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> <li>2.1 Assessment location</li> <li>2.2 Farm plan</li> <li>2.3 Soil sampling guidelines</li> <li>2.4 Laid down procurement policies</li> <li>2.5 Good Agricultural Practices manual</li> <li>2.6 Ornamental plants production manual</li> <li>2.7 Farm policy</li> </ul>
<p>3. Methods of Assessment</p>	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> <li>3.1 Observation</li> <li>3.2 Written tests</li> <li>3.3 Oral questioning</li> <li>3.4 Third party reporting</li> </ul>
<p>4. Context of</p>	<p>Competency may be assessed:</p>

Assessment	<p>4.1 Off-the-job 4.2 On-the-job 4.3 Work placement -attachment</p> <p>Off the job assessment must be undertaken in a closely simulated workplace environment.</p>
5. Guidance information for assessment	<p>What can be assessed in holistic assessment (with other units relevant to the industry sector, workplace and job roles) is recommended. Attitude is assessed alongside production of ornamental plants.</p>

## PRODUCE CUT FLOWERS

**UNIT CODE:** HO/OS/HP/CR/09/6

### UNIT DESCRIPTION

This unit specifies the competencies required to produce quality and clean cut flowers. It involves preparation of the production structures, planting, carrying out husbandry practices while observing regulatory requirements and keeping accurate production records, carrying out postharvest handling of the flowers and generating a production report.

### ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
These describe the key outcomes which make up workplace function.	These are assessable statements which specify the required level of performance for each of the elements. <i><b>Bold and italicized terms are elaborated in the range.</b></i>
1. Prepare to produce cut flowers	1.1 <b>Cut flowers</b> to be established are determined in accordance with <b>Agro Ecological Zone</b> , farm plan and market demand 1.2 Site for production of the cut flowers is selected as per the farm plan 1.3 <b>Tools, equipment, materials and supplies</b> are identified and sourced based on the type of cut flower to be established 1.4 Soil for analysis is sampled as per <b>sampling procedure</b> 1.5 Propagation structure is prepared in accordance with the cut flowers production manual 1.6 Soil-based growing medium is prepared in accordance with <b>Good Agricultural Practices (GAP)</b> manual and cut flowers production manual 1.7 <b>Soilless growing medium</b> is prepared in accordance with Good Agricultural Practices (GAP) manual and cut flowers production manual 1.8 <b>Planting materials</b> are sourced for in accordance with HCDA <b>phyto-sanitary requirements, procurement procedures</b> and the acreage to be planted.
2. Produce cut flowers	2.1 Cut flowers are planted as per Good Agricultural Practices (GAP) manual and cut flowers production manual 2.2 Cut flowers are watered, weeded, supported, thinned, pinched, disbudded, and pruned as per the cut flowers production manual 2.3 Cut flowers are fertigated and chemigated based on the nutrient requirement of the cut flowers 2.4 Pests and diseases in cut flowers are controlled based on GAP and cut flowers production manual 2.5 Physiological disorders in the cut flowers are managed as per the cut flowers production manual 2.6 Cut flowers are induced to flower as per GAP and type of cut flower 2.7 The cut flowers are harvested as per cut flowers production
3. Evaluate production of cut flowers	3.1 Quality of cut flowers produced is evaluated based on <b>flower quality parameters</b> and cut flowers production manual 3.2 Quantity of cut flowers produced is evaluated based on cut flowers

	<p>production manual</p> <p>3.3 <b>Return on investment</b> is determined as per accounting principles</p> <p>3.4 Recommendations are made based on evaluation report</p>
4. Complete production of cut flowers	<p>4.1 Post-harvest handling of cut flowers is carried out as per flower production manual</p> <p>4.2 Cut flowers production is documented in accordance with cut flowers production manual</p> <p>4.3 Cut flowers production reports are shared in accordance with farm policy</p> <p>4.4 Waste management is undertaken in accordance with Environmental Management and Coordination Act (EMCA)</p>

### RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

Variable	Range
<i>Cut flowers</i> include but not limited to:	<ul style="list-style-type: none"> <li>• Roses</li> <li>• Carnation</li> <li>• Alstromeria</li> <li>• Gypsophila</li> <li>• Ornis</li> <li>• Hydrangea</li> <li>• Strelitzia</li> <li>• Arabicum</li> <li>• Orchids</li> <li>• Agapanthus</li> <li>• Delphinium</li> </ul>
<i>Planting materials</i> include but not limited to:	<ul style="list-style-type: none"> <li>• Cuttings</li> <li>• bulbs</li> <li>• Tubers</li> <li>• Corms</li> <li>• Tissue culture</li> <li>• Embryo culture</li> <li>• Buds</li> <li>• Suckers</li> <li>• Corms</li> </ul>

<p><b><i>Soilless growing medium</i></b> include but not limited to:</p>	<ul style="list-style-type: none"> <li>• Vermiculite</li> <li>• Perlite</li> <li>• Pumice</li> <li>• Coco peat</li> </ul>
<p><b>Tools</b> includes but not limited to:</p>	<ul style="list-style-type: none"> <li>• Hoes</li> <li>• Machetes</li> <li>• Shovels</li> <li>• Soil augur</li> <li>• Panga</li> <li>• Pegs</li> <li>• Hammer</li> <li>• Saw</li> <li>• Bucket</li> <li>• Secateurs</li> <li>• Shears</li> <li>• Pegs</li> </ul>
<p><b><i>Equipment</i></b> includes but not limited to:</p>	<ul style="list-style-type: none"> <li>• Spray pumps</li> <li>• Watering cans</li> <li>• Hose pipes</li> <li>• Plough</li> <li>• Harrows</li> <li>• Pruning saw</li> <li>• Wire strainer</li> <li>• Traps</li> <li>• Pipe sprinklers</li> <li>• Scouting flags</li> <li>• Storage tanks</li> <li>• Tractors</li> </ul>
<p><b><i>Materials and Supplies</i></b> includes but not limited to:</p>	<ul style="list-style-type: none"> <li>• Pesticides</li> <li>• Fertilizers</li> <li>• Stationery</li> <li>• Manures</li> <li>• Seedlings /planting materials</li> <li>• Khaki paper bags size 3</li> <li>• Rope</li> <li>• Nets</li> <li>• Translucent papers</li> <li>• Papers</li> <li>• Fencing wire</li> <li>• Nails</li> </ul>

	<ul style="list-style-type: none"> <li>• Herbicides</li> <li>• Pesticides</li> </ul>
<p><b><i>Materials and Supplies</i></b> includes but not limited to:</p>	<ul style="list-style-type: none"> <li>• Pesticides</li> <li>• Fertilizers</li> <li>• Stationery</li> <li>• Manures</li> <li>• Seedlings /planting materials</li> <li>• Khaki paper bags size 3</li> <li>• Rope</li> <li>• Nets</li> <li>• Translucent papers</li> <li>• Papers</li> <li>• Fencing wire</li> <li>• Nails</li> <li>• Herbicides</li> <li>• Pesticides</li> </ul>
<p><b><i>Soil sampling procedure</i></b> includes but not limited to:</p>	<p>The process of</p> <ul style="list-style-type: none"> <li>• soil collection,</li> <li>• packaging and</li> <li>• submission for analysis</li> </ul>
<p><b><i>Soiless growing medium</i></b> includes but not limited to</p>	<ul style="list-style-type: none"> <li>• peat moss</li> <li>• perlite</li> <li>• vermiculite</li> <li>• sand</li> </ul>
<p><b><i>Agronomic requirements</i></b> include but not limited to:</p>	<ul style="list-style-type: none"> <li>• Growing cycle and growing period</li> <li>• Radiation</li> <li>• Temperature</li> <li>• Rooting</li> <li>• Aeration</li> <li>• Water quantity and quality</li> <li>• Nutrients</li> <li>• Salinity</li> <li>• Pests</li> <li>• Diseases</li> <li>• Weeds</li> <li>• Wind</li> </ul>
<p><b><i>Phyto-sanitary requirements</i></b> includes but not limited to:</p>	<ul style="list-style-type: none"> <li>• Rules on use of agro-chemicals on plants</li> <li>• Rules maximum levels of agro-chemical residues in plants</li> <li>• Rules on materials intended to come into contact with plants</li> <li>• Rules on certification of ornamental producers</li> </ul>

## **REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

### **Required skills**

The individual needs to demonstrate the following skills:

- Tilling
- Measuring
- Leveling
- Gaping
- Pruning
- Spraying
- Fertigation and chemigation in production of cut flowers
- Pests , diseases and nutrients deficiency scouting
- Equipment calibration
- Technical Report writing
- handling of cut flowers
- Soil sampling
- Observation
- Negotiation
- Digital literacy

### **Required knowledge**

The individual needs to demonstrate knowledge of:

- Sources of quality water
- Agro Ecological Zonation
- Types of tools and equipment used in production of cut flowers
- Structures for production of cut flowers
- Types of cut flowers
- Physiology of cut flowers
- Soil sampling and testing
- Soil conservation
- Phyto-sanitary requirements
- Good Agricultural Practices
- Sources of quality planting materials for cut flowers
- Husbandry practices in cut flowers production
- Cut flowers production Technologies
- Fertigation and chemigation in production of cut flowers
- Procedures for calibration of equipment
- Soilless growing medium
- Flower induction
- Maturity indices in cut flowers
- Harvesting and Post Harvesting Handling of cut flowers
- Accounting principles

- Production records and reports
- Waste Management
- Occupational Safety and Health Procedures
- Harvesting and Post Harvesting Handling of cut flowers
- General management of cut flowers production farm

## EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical Aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Prepared planting structure to a level suitable to the planting material</li> <li>1.2 Sourced planting materials adequate for the prepared structure</li> <li>1.3 Prepared growing medium as per the HCDA phyto-sanitary guide</li> <li>1.4 Established cut flowers suitable for the market demand</li> <li>1.5 Applied safety measures by using Personal Protective Equipment</li> <li>1.6 Followed required process of producing ornamental plants</li> <li>1.7 Efficiently used the inputs</li> <li>1.8 Harvested and carried out post-harvest handling of cut flowers</li> <li>1.9 Prepared accounting documents</li> <li>1.10 Prepared production report</li> </ul>
2. Resource Implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> <li>2.1 Assessment location</li> <li>2.2 Farm plan</li> <li>2.3 Soils sampling guidelines</li> <li>2.4 Laid down procurement policies</li> <li>2.5 Good Agricultural Practices manual</li> <li>2.6 HCDA phyto-sanitary guide</li> <li>2.7 Cut flowers production manual</li> <li>2.8 Farm policy</li> </ul>
3. Methods of Assessment	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> <li>3.1 Observation</li> <li>3.2 Written tests</li> <li>3.3 Oral questioning</li> <li>3.4 Interviews</li> </ul>
4. Context of Assessment	<p>Competency may be assessed:</p> <ul style="list-style-type: none"> <li>4.1 Off-the-job</li> <li>4.2 On-the-job</li> <li>4.3 Work placement -attachment</li> </ul> <p>Off the job assessment must be undertaken in a closely simulated workplace environment.</p>
5. Guidance information for assessment	<p>What can be assessed in holistic assessment (with other units relevant to the industry sector, workplace and job roles) is recommended. Attitude is assessed alongside production of</p>



	cut flowers.
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## PRODUCEVEGETABLE CROPS

**UNIT CODE:** HO/OS/HP/CR/10/6

### UNIT DESCRIPTION

This unit specifies the competencies required to produce quality and clean vegetables. It involves seedbed preparation, planting, carrying out husbandry practices on the vegetables while observing regulatory requirements and keeping production records, carrying out post-harvest handling of vegetables and generating a production report.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
<p>These describe the key outcomes which make up workplace function.</p>	<p>These are assessable statements which specify the required level of performance for each of the elements.  <b><i>Bold and italicized terms are elaborated in the range.</i></b></p>
<p>1. Prepare to produce vegetables</p>	<p>1.1 <b><i>Vegetables (exotic, indigenous and Asian)</i></b> to be established are determined in accordance with <b><i>Agro Ecological Zone, farm plan</i></b> and <b><i>market demand</i></b></p> <p>1.2 Site for production of the vegetables is selected as per the <b><i>farm plan</i></b></p> <p>1.3 <b><i>Tools, equipment, materials and supplies</i></b> are identified and sourced based on the requirements of the job</p> <p>1.4 Soil for analysis is sampled as per <b><i>sampling procedure</i></b></p> <p>1.5 Soil erosion is controlled based on topography, soil type and level of degradation</p> <p>1.6 <b><i>Propagation structure</i></b> is prepared in accordance with the vegetables production manual</p> <p>1.7 <b><i>Soil-based growing medium</i></b> is prepared in accordance with <b><i>Good Agricultural Practices (GAP)</i></b> manual and vegetables production manual and <b><i>HCDA phyto-sanitary requirements</i></b></p> <p>1.8 <b><i>Soilless growing medium</i></b> is prepared in accordance with GAP manual and vegetables production manual and HCDA phyto-sanitary requirements</p> <p>1.9 <b><i>Planting materials</i></b> are sourced in accordance with procurement procedure phyto-sanitary requirements and size of the vegetable seedbed.</p> <p>1.10 Planting holes vegetable seedlings are prepared based on agronomic requirements, GAP and MoALF vegetable production manual</p>
<p>2. Establish vegetables gardens</p>	<p>2.1 Vegetables are planted as per agronomic requirements</p> <p>2.2 <b><i>Vegetable seed bed</i></b> is gapped, thinned, weeded, watered in accordance with MOALF vegetables production manual</p> <p>2.3 Vegetables are trained, pruned and de-suckered as per the MOALF vegetables production manual</p> <p>2.4 Established vegetables are fed in accordance with GAP and the MOALF vegetables production manual and soil analysis report</p> <p>2.5 Pests and diseases in vegetables are controlled based on GAP and vegetables production manual</p>

	<p>2.6 Physiological disorders in the vegetables are managed as per the vegetables production manual</p> <p>2.7 Root and tuber vegetables are earthed up and cured of as per the vegetables production manual</p> <p>2.8 The vegetables are harvested as per the vegetables production manual</p>
3. Evaluate vegetables produced	<p>3.1 <b>Quality</b> of vegetables produced is evaluated based on <b>vegetable quality parameters</b> and vegetables production manual</p> <p>3.2 <b>Quantity</b> of vegetables produced is evaluated based on vegetables production manual</p> <p>3.3 <b>Return on investment</b> is determined as per accounting principles</p> <p>3.4 Recommendations are made based on the evaluation report</p>
4. Complete production of vegetables	<p>4.1 Post-harvest handling of vegetables is carried out as per MoALF production manual</p> <p>4.2 Vegetables production is documented in accordance with vegetables production manual</p> <p>4.3 Vegetables production reports are shared in accordance with farm policy</p> <p>4.4 Waste management is undertaken in accordance with Environmental Management and Coordination Act (EMCA)</p>

### RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

Variable	Range
<b>Exotic vegetables</b> include but not limited to:	<ul style="list-style-type: none"> <li>• Cole crops: cabbage, kales, broccoli, and cauliflower</li> <li>• Solanaceae: tomato, Irish potato, capsicum</li> <li>• Legumes: French beans, garden peas:</li> <li>• Root vegetables: onions, carrots</li> <li>• Others: Sweet corn, lettuce, spinach, asparagus, cucumber, melons, squash</li> </ul>
<b>Indigenous and Asian vegetables</b> include but are not limited to:	<ul style="list-style-type: none"> <li>• Eggplant/ brinjals,</li> <li>• capsicums,</li> <li>• okra ,</li> <li>• karella,</li> <li>• moringa,</li> <li>• black nightshade,</li> <li>• Spider weed,</li> <li>• amaranths,</li> <li>• cowpeas,</li> <li>• pumpkin,</li> <li>• crotalaria</li> </ul>
<b>Growing structures</b> include but are not limited to:	<ul style="list-style-type: none"> <li>• seed bed</li> <li>• greenhouses</li> <li>• shade houses</li> <li>• hotbeds</li> </ul>

	<ul style="list-style-type: none"> <li>• cold beds</li> <li>• pots</li> </ul>
<b><i>Planting materials</i></b> include but not limited to:	<ul style="list-style-type: none"> <li>• cuttings</li> <li>• seedlings</li> <li>• seeds</li> <li>• bulbs</li> <li>• tubers</li> <li>• corms</li> <li>• tissue culture</li> <li>• embryo culture</li> <li>• buds</li> <li>• suckers</li> </ul>
<b><i>Soil based growing medium</i></b> includes but not limited to:	<ul style="list-style-type: none"> <li>• forest soil</li> <li>• sub soil</li> </ul>
<b><i>Tools</i></b> includes but not limited to:	<ul style="list-style-type: none"> <li>• Hoes</li> <li>• Machetes</li> <li>• Secateurs</li> <li>• Shovels</li> <li>• Soil augur</li> <li>• Panga</li> <li>• Pegs</li> <li>• Hammer</li> <li>• Saw</li> <li>• Bucket</li> <li>• Shears</li> </ul>
<b><i>Equipment</i></b> includes but not limited to:	<ul style="list-style-type: none"> <li>• Spray pumps</li> <li>• Watering cans</li> <li>• Hose pipes</li> <li>• Plough</li> <li>• Harrows</li> <li>• Ridges</li> <li>• Boom sprayer</li> <li>• Pruning saw</li> <li>• Wire strainer</li> <li>• Traps</li> <li>• Pipes sprinklers</li> <li>• Scouting flags</li> <li>• Storage tanks</li> <li>• Gutters</li> <li>• Tractors</li> <li>• Grading shed</li> <li>• Bud count square</li> </ul>
<b><i>Materials and supplies</i></b> includes but not limited to:	<ul style="list-style-type: none"> <li>• Manures</li> <li>• Seedlings</li> <li>• Khaki paper bags size 3</li> <li>• Rope</li> </ul>

	<ul style="list-style-type: none"> <li>• Nets</li> <li>• Trellising wire</li> <li>• poles</li> <li>• Pesticides</li> <li>• Pheromones</li> <li>• Fertilizers</li> <li>• Stationery</li> <li>• Nails</li> <li>• Fencing wire</li> <li>• Fencing wire</li> <li>• Staking sticks</li> <li>• Pegs</li> </ul>
<i>Soil sampling procedure</i> includes but not limited to:	The process of <ul style="list-style-type: none"> <li>• soil collection,</li> <li>• packaging and</li> <li>• submission for analysis</li> </ul>
<i>Soilless growing medium</i> includes but not limited to	<ul style="list-style-type: none"> <li>• peat moss</li> <li>• perlite</li> <li>• vermiculite</li> <li>• sand</li> </ul>
<i>Agronomic requirements</i> include but not limited to:	<ul style="list-style-type: none"> <li>• Growing cycle and growing period</li> <li>• Radiation</li> <li>• Temperature</li> <li>• Rooting</li> <li>• Aeration</li> <li>• Water quantity and quality</li> <li>• Nutrients</li> <li>• Salinity</li> <li>• Pests</li> <li>• Diseases</li> <li>• Weeds</li> <li>• Wind</li> </ul>
<i>Phyto-sanitary requirements</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Rules on use of agro-chemicals on plants</li> <li>• Rules maximum levels of agro-chemical residues in plants</li> <li>• Rules on materials intended to come into contact with plants</li> <li>• Rules on certification of ornamental producers</li> </ul>

## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

### Required skills

The individual needs to demonstrate the following skills:

- Tilling
- Measuring
- Leveling
- Gaping

- Pruning
- Spraying
- Pests , diseases and nutrients deficiency scouting
- Equipment calibration
- Technical Report writing
- Soil sampling
- Observation
- Negotiation
- Digital literacy

### Required knowledge

The individual needs to demonstrate knowledge of:

- Sources of quality water
- Agro Ecological Zonation
- Types of tools and equipment used in production of vegetables
- Structures for production of vegetables
- Types of vegetables
- Physiology of vegetables
- Soil sampling and testing
- Soil conservation
- Phyto-sanitary requirements
- Good Agricultural Practices
- Sources of quality planting materials for vegetables
- Husbandry practices in vegetable production
- Vegetable production Technologies
- Procedures for calibration of equipment
- Soilless growing medium
- Maturity indices in vegetables
- Harvesting and Post Harvesting Handling of vegetables
- Accounting principles
- Production records and reports
- Waste Management
- Occupational Safety and Health Procedures
- Harvesting and Post Harvesting Handling of vegetables
- General management of vegetable farm

### EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Prepared planting structures to a level suitable to the planting material
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	<ul style="list-style-type: none"> <li>1.2 Sourced planting materials adequate for the prepared structure</li> <li>1.3 Prepared planting medium (soil based and soilless) as per the HCDA phytosanitary guide</li> <li>1.4 Established vegetables suitable for the market demand</li> <li>1.5 Applied safety measures by using Personal Protective Equipment</li> <li>1.6 Followed required process of producing vegetables</li> <li>1.7 Efficiently used the inputs</li> <li>1.8 Harvested and carried out post-harvest handling of vegetables</li> <li>1.9 Prepared accounting documents</li> <li>1.10 Prepared production report</li> </ul>
2. Resource Implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> <li>2.1 Assessment location</li> <li>2.2 Farm plan</li> <li>2.3 Procurement policies</li> <li>2.4 Good Agricultural Practices manual</li> <li>2.5 HCDA phyto-sanitary guide</li> <li>2.6 MoALFvegetables production manual</li> <li>2.7 2.7 Farm policy</li> </ul>
3. Methods of Assessment	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> <li>3.1 Observation</li> <li>3.2 Written tests</li> <li>3.3 Oral questioning</li> <li>3.4 Third party reporting</li> </ul>
4. Context of Assessment	<p>Competency may be assessed:</p> <ul style="list-style-type: none"> <li>4.1 Off-the-job</li> <li>4.2 On-the-job</li> <li>4.3 Work placement -attachment</li> </ul> <p>Off the job assessment must be undertaken in a closely simulated workplace environment.</p>
5. Guidance information for assessment	<p>What can be assessed in holistic assessment (with other units relevant to the industry sector, workplace and job roles) is recommended. Attitude is assessed alongside production of vegetables</p>





## MANAGE HORTICULTURAL PRODUCTION FARM

**UNIT CODE:** HO/OS/HP/CR/11/6

### UNIT DESCRIPTION

This unit specifies the competencies required to manage horticultural production farm. It involves generating management tools, allocating resources, monitoring and evaluating the management process and generating management reports.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b> These describe the key outcomes which make up workplace function.	<b>PERFORMANCE CRITERIA</b> These are assessable statements which specify the required level of performance for each of the elements. <i><b>Bold and italicized terms are elaborated in the range.</b></i>
1. Prepare to manage horticultural production farm	1.1 Strategic Plan is prepared in accordance with the Business environment analysis report 1.2 <i><b>Annual Implementation Plan</b></i> is developed based on Strategic Plan 1.3 Budget is prepared as per the Annual Implementation Plan 1.4 <i><b>Resources</b></i> required are sourced in accordance with Strategic Plan and Standard Operations Procedures 1.5 <i><b>Management Information System</b></i> is installed in accordance with the farm needs 1.6 <i><b>Financial plan</b></i> is prepared based on the Strategic Plan
2. Manage horticultural production farm	2.1 Management functions are carried out in accordance with the Strategic Plan 2.2 <i><b>Resources</b></i> are allocated in accordance with the annual implementation plan 2.3 Finances are utilized based on the financial plan
3. Evaluate management of horticultural production farm	3.1 Monitoring and evaluation is undertaken according to Strategic Plan, Annual Implementation Plan and Standard Operation Procedures 3.2 Auditing of the production is carried out based on the Strategic Plan, Annual Implementation Plan 3.3 Audit queries are reported and addressed
4. Complete management of horticultural production farm	4.1 Management report is prepared based on Strategic Plan and Annual Implementation Plan 4.2 Management report is shared with relevant partners in accordance with <b>Standard Operation Procedures</b>

### RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

<b>Variable</b>	<b>Range</b>
<i><b>Annual Implementation</b></i>	<ul style="list-style-type: none"> <li>• Annual Activities</li> </ul>

<i>Plan</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Annual Costs</li> <li>• Annual schedules</li> </ul>
<i>Management Information System</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Collecting of information</li> <li>• processing of information</li> <li>• use of ICT equipment</li> </ul>
<i>Resources</i> include but not limited to:	<ul style="list-style-type: none"> <li>• Materials</li> <li>• Energy</li> <li>• Services</li> <li>• Staff</li> <li>• Knowledge</li> <li>• Other assets that are transformed to produce benefit</li> </ul>
<i>Standard Operation Procedures</i> include but not limited to:	<ul style="list-style-type: none"> <li>• set of step-by-step instructions for carrying out routine operations</li> <li>• set of step-by-step instructions for operating machines and equipment</li> </ul>
<i>Farm plan</i> includes but not limited to:	<ul style="list-style-type: none"> <li>• Land layout</li> <li>• Cropping calendars</li> <li>• Rotational plans</li> </ul>

## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

### Required skills

The individual needs to demonstrate the following skills:

- Public Communication
- Negotiation
- Planning
- Organizing
- Performance Management
- Technical report writing
- Controlling
- Coordinating
- Problem solving
- Critical thinking
- Decision making
- Persuasion
- Management of Financial Resources
- Systems and processes Analysis
- Systems and processed Evaluation

### Required knowledge

The individual needs to demonstrate knowledge of:

- Strategic planning
- resource allocation
- coordination of people and resources
- Farm as an organization
- Policy formulation
- Daily farm operations
- Financial management
- Machines and tools, including their designs, uses, repair, and maintenance
- practical application of engineering science and technology
- Building and Construction
- Human behavior and performance
- Laws, legal codes, court procedures, precedents, government regulations, executive orders, agency rules
- Public Safety and Security
- Sales and Marketing
- Economics and Accounting
- Delegation
- Staff recruitment
- Motivation

### **EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Prepared a strategic plan 1.2 Prepared a budget 1.3 Installed a Management Information System 1.4 Prepared a financial plan 1.5 Carried out farm planning 1.6 Allocated resources 1.7 Monitored and evaluated farm activities 1.8 Developed a farm report 1.9 Shared a farm report
2. Resource Implications	The following resources must be provided: 1. Farm business plan 2. Standard Operations Procedures 3. Business operating environment assessment report
3. Methods of Assessment	Competency may be assessed through: 3.1 Observation 3.2 Written tests 3.3 Oral questioning 3.4 Third party reporting

<p>4. Context of Assessment</p>	<p>Competency may be assessed:</p> <p>4.1 Off-the-job</p> <p>4.2 On-the-job</p> <p>4.3 Work placement -attachment</p> <p>Off the job assessment must be undertaken in a closely simulated workplace environment.</p>
<p>5. Guidance information for assessment</p>	<p>What can be assessed in holistic assessment (with other units relevant to the industry Sector, workplace and job roles) is recommended. Attitude is assessed alongside management of horticultural crops production farm</p>